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AMERICAN AIR FILTER CO. INC.

LOUISVILLE, KY

Multi-Panel Air Filter

— TYPE-S —
FOR CONTINUOUS
HEAVY DUTY SERVICE
— TYPE-V —
FOR VENTILATION OR
INTERMITTENT SERVICE

AMERICAN AIR FILTER COMPANY, INC.

INCORPORATED

MIDWEST

Reed Air
filters ALL METAL

NATIONAL
AIR FILTERS
NATIONAL

GENERAL OFFICES



LOUISVILLE, KENTUCKY



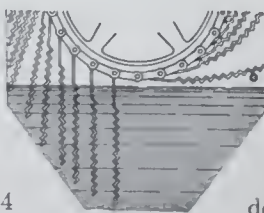
The Multi-Panel Air Filter

Type "S" for Continuous or Heavy-Duty Service and
Type "V" for Ventilation or Intermittent Service

THE Multi-Panel Air Filter originally developed to meet the severe operating conditions and exacting air cleaning requirements of steel mill service has established a new high standard of performance for automatic air filtration. Cleaning the air required for cooling steel mill motors, due to the fact that they operate continuously 24 hours a day and because of the nature and volume of the impurities in the air, is recognized as the most difficult air cleaning problem within the scope of modern air filters, demanding:

- (1) The highest efficiency in dust removal.
- (2) A constant, unvarying air supply.
- (3) Absolutely no oil entrainment, and
- (4) Continuous uninterrupted service.

The Multi-Panel Air Filter, designed to meet these specific requirements, represents the most outstanding advancement in modern air cleaning equipment. Its efficiency in dust removal, while



guaranteed 98%, is more nearly perfect air cleaning than ever before attained. Tests made in actual service under most adverse operating conditions with Dust Comparators exposed for 48 hours showed *not one visible dust particle* on the clean-air side of the filter.

The operating resistance is constant. It does not vary as much as $\frac{1}{10}$ of an inch, even when the filter is operated continuously 24 hours a day with an excess dust concentration. Constant resistance means a constant, unvarying air supply which is an essential requirement in many types of industrial applications and particularly in the ventilation of mill motors, turbo-generators or other electrical equipment.

Constant operating resistance also means positive self-cleaning, a feature of the Multi-Panel Filter, based on an entirely new and unique method of separating the panels and cleaning each one individually.

MULTI-PANEL CONSTRUCTION

THE filtering media consists of a multiplicity of closely overlapping screen panels which form a continuous, movable curtain. The panels, suspended from horizontal rods carried on two endless chains, overlap each other like shingles on a roof, forming a filtering curtain with a depth of five panels at every point through which the air must pass. The specially processed woven screen used for these filter panels, is folded upon itself to give double thickness of media and added strength. The panels are corrugated longitudinally to secure the desired spacing between successive layers, supply additional voids for dust accumulation, and provide increased filtering area.

When the filter curtain enters the oil bath in the reservoir at the base of the filter, the panels are automatically separated and individually cleaned, thus securing thorough and positive self-cleaning.



The filter curtain is composed of overlapping screen panels suspended from horizontal rods which are carried on two endless chains. The screen panels are corrugated and receive a bakelite-fibre coating to secure maximum filtering effect.

MECHANICAL OPERATION

THE filter curtain, rotated by a simple ratchet mechanism moves $\frac{3}{4}$ of an inch every 12 minutes or $3\frac{3}{4}$ inches an hour. In 24 hours the curtain travels 7 ft. 6 in., which means that with a filter 10 ft. high the curtain on the air entering side is completely renewed each day and the part on the second pass will have been out of the oil only 24 hours, which is the length of time usually recommended for draining a freshly charged Unit Air Filter before putting it into service.

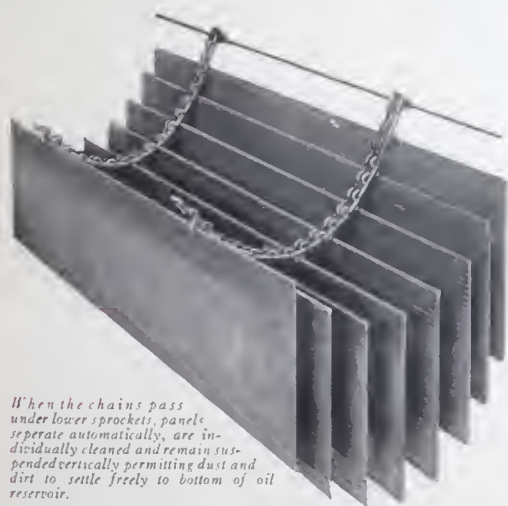
Under severe dust conditions the speed at which the curtain rotates may be increased to maintain a normal operating resistance.

The upper or top sprockets which carry the filtering curtain are keyed to the shaft on one end of which is the ratchet drive and on the other a simple pin coupling for connecting two or more filter sections on larger installations. The lower shaft is mounted in spring take-up bearings to maintain the proper tension on the filtering curtain at all times.

The edges of the filtering curtain travel in channel sections which are part of the filter casing. These channels are thoroughly lubricated by the oil from the panels and provide an effective air seal. The ends of the rods which carry the panels also move in this channel, forming a substantial support for the filtering curtain.



Top removed from Multi-Panel Filter showing overlapping panels.



When the chains pass under lower sprockets, panels separate automatically, are individually cleaned and remain suspended vertically permitting dust and dirt to settle freely to bottom of oil reservoir.

BAKELITE-FIBRE COATED PANELS

Since an adhesive impingement type filter cleans the air by trapping the dust with an adhesive coated filtering media it is evident that the more adhesive that a filter media can retain without danger of entrainment, the greater will be the dust holding capacity of the filter and the longer it will operate without loss of efficiency.

To increase the capillary surface effect of the woven wire panels which constitute the filtering media in the Multi-Panel Filter, they receive a bakelite-fibre coating. The panels are coated with liquid bakelite, covered with fine fibre and oven-baked. This forms a porous fibrous coating which is capable of retaining many times the amount of adhesive which normally would be held on the smooth surface of the bare wire.

AMERICAN Air filters

THE VISUAL DUST COMPARATOR

A practical method for observing the efficiency of air cleaners



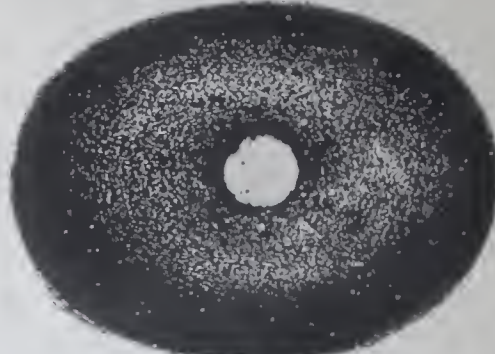
DIRECTIONS: Smear the depression with thin coat of vaseline and suspend rigidly in air passage before and after the cleaning device with depression facing air flow. A comparison of dust deposits after a short two days' exposure will plainly tell the story.

Unretouched photograph of Visual Dust Comparator exposed for 48 hours before and after a Multi-Panel Filter in steel mill service. This test, made by the engineers of the steel company shows an efficiency in excess of 90%.

This Visual Dust Comparator developed by our research engineers offers a simple and practical method of determining efficiency in dust removal. Other methods including weighing, counting, etc., require an experienced operator which limits their use largely to the laboratory. The results secured with Comparators plainly show the relative dust content of the air before and after passing thru a filter—thus providing a practical gauge of efficiency independent of the operator's experience.

THE VISUAL DUST COMPARATOR

A practical method for observing the efficiency of air cleaners



DIRECTIONS: Smear the depression with thin coat of vaseline and suspend rigidly in air passage before and after the cleaning device with depression facing air flow. A comparison of dust deposits after a short two days' exposure will plainly tell the story.

HOW IT CLEANS THE AIR

THE air cleaning principle used in the Multi-Panel Filter is identical with the original method introduced over eight years ago in the Unit Air Filter, now cleaning more than 300,000,000 cubic feet of air per minute and generally recognized for its high efficiency in dust removal.

Air entering the Multi-Panel Filter at any point must pass twice thru the thickness of six panels, in the Type S (4 in the Type V) each of which is doubled—giving 12 impingements for each pass or a total of 24 impingements. The nature of the filtering media is such that it breaks the air up into innumerable fine streams and brings it into intimate

contact with the adhesive coated surfaces which together with the great number of successive impingements secures an unusually high cleaning efficiency.

HOW IT CLEANS ITSELF

Positive "self-cleaning" is made possible by the ingenious manner in which the "sheets" of filtering media are automatically separated, cleaned and then reassembled.

It is this basic separation principle which accounts for the unusual performance characteristics of the Multi-Panel Filter. The panels automatically separate and are cleaned one at a time by swinging thru the oil in an arc 90°. This action which loosens and removes the dust accumulation from each panel individually is positive and continuous. Thus the self-cleaning feature of the Multi-Panel Filter is entirely automatic and an integral part of the filter's operation. While in the oil bath the panels hang vertically which permits the dirt to settle freely to bottom of the reservoir where it is deposited into the sediment pan. The clean and freshly charged panels are again reassembled into the filtering curtain as they enter the air stream.

SEDIMENT REMOVAL

THE dust and dirt washed from the panels, having a higher specific gravity than the oil, settle to the bottom of the reservoir in the form of sludge. To concentrate this sludge the sides of the reservoir are sharply sloped and a pan or receptacle fits snugly in the bottom to receive the deposit.

Removable handles extend above the Adhesine level for convenience in removing the sediment pan.

The large capacity of the sediment pan in the Multi-Panel Filter makes it necessary to remove the sediment only four to six times a year depending upon the operating conditions.



Multi-Panel Filter is a registered trademark of the American Air Filter Company, Inc.

Curtain leaves air stream—panels separate and release oil held by capillary attraction at numerous points of contact between adjacent panel, recharging curtain before entering 2nd pass.

Multi-Panel filter curtain composed of closely overlapping screen panels, forming a dense filtering media having maximum efficiency in dust removal.

Panels made of specially processed woven screen, bakelite-fibre coated to secure porous capillary surface which will retain many times the amount of adhesive and dirt than normally held on smooth, bare wire.

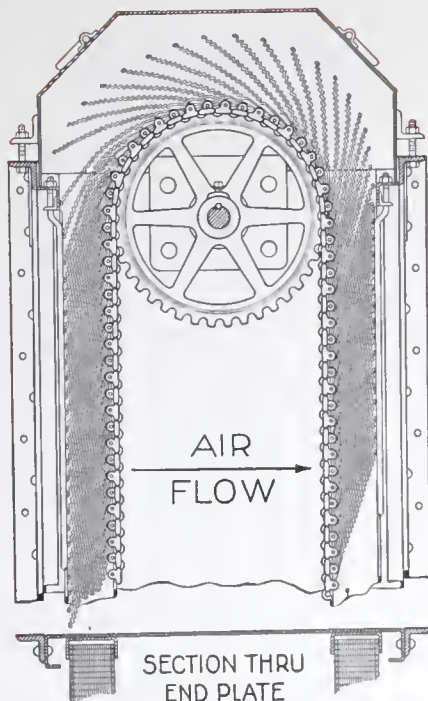
Screen folded upon itself to give panels double strength and increased filtering surface.

Corrugations provide necessary spacing between panels and supply voids for dust accumulation.

The clean and freshly charged curtain enters the air stream on "dirty" side of the filter, presenting best condition for trapping heavy dust.

Each panel drains for 1 1/2 hours before entering air stream.

Suspended panels permit dirt to settle freely to bottom of reservoir—vertical removal strips off excess oil.



The dirt trapped in the 1st pass is securely bound by the renewed viscous coating as curtain enters 2nd pass.

The best condition for final cleaning is maintained in the 2nd pass since a slightly dirty media has a higher efficiency in the removal of fine dust than when perfectly clean.

Efficiency in dust removal guaranteed 98%, but may be varied by changing number of panels or mesh of screen.

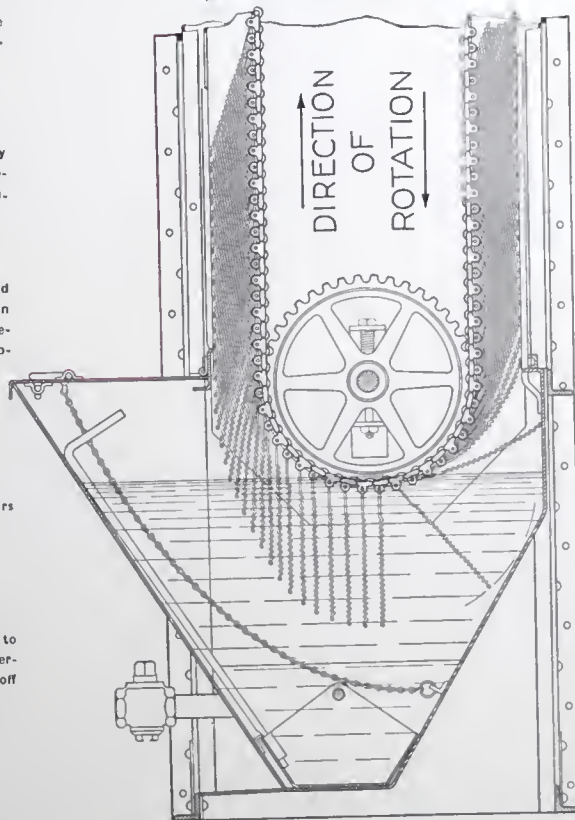
Punched angle frame around air openings front and back provided for duct connections.

The normal rate at which the curtain moves is 3/4 of an inch every 12 minutes but this speed may be increased for excessive dust concentrations.

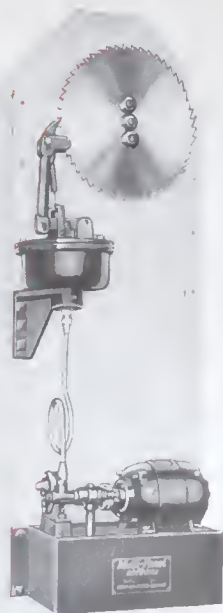
Constant resistance insures constant unvarying air supply.

Positive self-cleaning is accomplished by the ingenious manner in which the panels automatically separate and are individually cleaned by swinging through the oil.

Sediment is deposited directly into sediment pan and needs to be removed only 3 or 4 times a year.

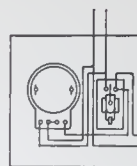


MULTI-PANEL OPERATING MECHANISM

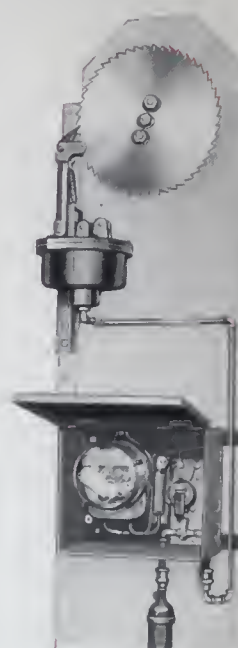


Hydrolic Drive

TO LIGHTING SERVICE



TO MOTOR



Pneumatic Drive

Two types of drives are furnished with the Multi-Panel filter—Mechanical and Bellows. The Mechanical drive consists of a motor, a gear reduction and an eccentric plate for operating the ratchet pawl. The Bellows drive operates the pawl thru a specially designed compression-type Sylphon Bellows. The Bellows is laminated being made of two thicknesses of metal and is really two Bellows, one within the other. It is mounted in a heavy cast iron casing and the pressure is applied between the casing and the Bellows, thus causing the Bellows to be compressed rather than expanded. Pneumatic operation (right) is recommended wherever compressed air is available at 15 lbs. pressure. The Hydrolic operator (left) is a self-contained unit consisting of motor, pump and pressure regulating valve mounted on a small oil reservoir.

The control box shown at the right contains a Telechron Timer making contact every twelve minutes, controlling a magnetic air valve for Pneumatic, or a magnetic switch for Hydrolic or Mechanical Drive. The motor used with the Hydrolic or Mechanical Drive is $\frac{1}{2}$ H. P. repulsion

induction type, either 110-220 Volt D. C. or single phase 60 cycle A. C. operated from lighting service. One drive, either Mechanical or Bellows will operate two Multi-Panel sections of maximum height.

MECHANICAL SPECIFICATIONS

THE Multi-Panel filter is made in two types—Type S for continuous heavy-duty service and Type V for ventilation or intermittent service. The construction and dimensions of both types are the same thruout, the only difference is that the Type V has fewer panels in the filtering curtain to conform with the resistance allowable in ventilation practice.

The filter casing, oil reservoir and other sheet metal parts of the Multi-Panel filter are made of heavy 10-gauge blue annealed steel with all joints electrically welded. All mechanical parts, including chains, sprockets, bearings and driving mechanism are designed with a high safety factor for the load imposed to insure long life and dependable service.

Air openings, front and back, are framed with $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{2}$ " angle iron riveted to the casing with 3 16" rivets on $4\frac{1}{2}$ " centers. This framing serves the double purpose of reinforcing the casing and providing means for duct connections. The outstanding leg of the angle is punched with $\frac{1}{4}$ " holes on $4\frac{1}{2}$ " centers, $\frac{1}{2}$ " standard gauge.

The filter curtain is composed of overlapping panels suspended from horizontal cross rods spaced at intervals of 1.8". The panels are subjected to no mechanical strain and have no frictional bearing except the slight portion in the end guide channels which are thoroughly lubricated with the oil from the filter curtains. Each panel is provided with a $\frac{1}{4}$ " stiffening rod at its bottom or free edge.

The endless chains which support the panels travel over the sprockets on a driven shaft at the top of the filter and under idler sprockets at the bottom provided with spring take up bearings to maintain proper tension on the filter curtain at all times. The top shaft which runs in ball bearing is driven by a ratchet mechanism which moves the filter curtain three-quarters of an inch at regular intervals.

Adhesine "H", developed especially for the Multi-Panel filter is a clear water Russian base oil with characteristics unlike any available domestic base. Being a nearly perfect homogeneous oil its viscosity-temperature curve is quite flat between 32 and 0 F. It flows freely at minus 10 F, yet the pour test is only a few degrees lower, viz. minus 15 F. It is odorless and non-volatile, the evaporation being less than 1% (at 150 F. for 8 hours), which together with other desirable properties make it ideal for automatic air filter service.

GUARANTEE

The Multi-Panel Air Filter is guaranteed to be as represented in our printed specifications, data and tests. Any parts proving to be defective due to materials or workmanship will be replaced free of charge if returned to our factory, carrying charges prepaid, within one year of date of shipment.

MULTI-PANEL WEIGHTS INCLUDING ADHESINE

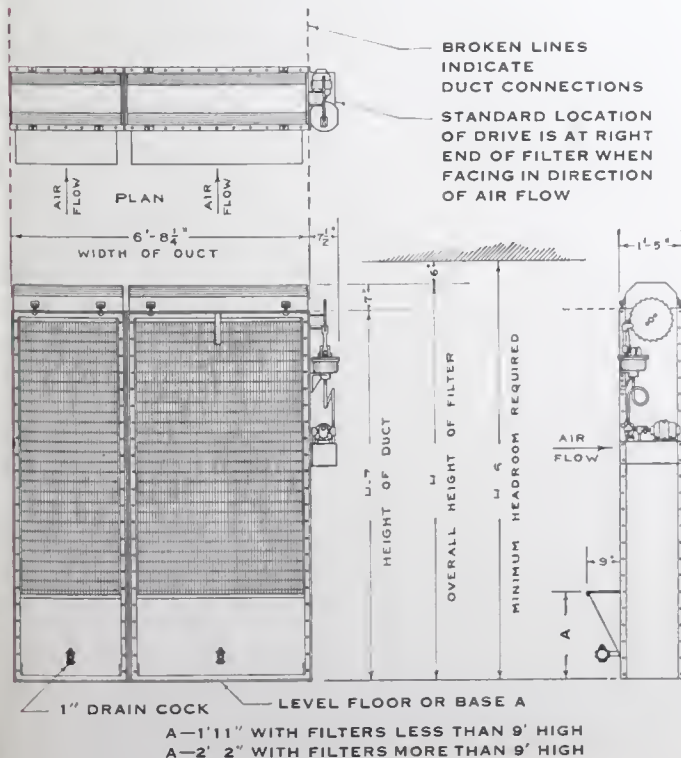
Overall Ht.-H	Series 30		Series 48	
	Actual Weight	Shipping Weight	Actual Weight	Shipping Weight
5	750	900	994	1150
5½	770	950	1022	1250
6	790	1000	1050	1350
6½	810	1050	1078	1400
7	830	1100	1106	1450
7½	850	1150	1134	1500
8	870	1250	1162	1550
8½	890	1300	1190	1600
9	910	1350	1218	1750
9½	930	1500	1246	1800
10	950	1550	1284	1850
10½	970	1600	1310	1900
11	990	1650	1338	1950
11½	1010	1700	1366	2000
12	1030	1750	1394	2050
12½	1050	1800	1422	2100
13	1070	1850	1450	2150

CAPACITY TABLE MULTI-PANEL AIR FILTERS—TYPE "S" OR TYPE "V"

To select the proper size filter for a given capacity first deduct 6" from the headroom available to determine the maximum overall height (H) of filter allowable. Then follow across the table to capacity desired. The heading of the column in which the capacity falls will give the number of sections required and the width (W) of the filter. Always use the tallest section that headroom will permit.

Height Overall	NUMBER OF SECTIONS												Height Overall
	No. 30	No. 48	1 1/2 No. 48	2 No. 48	2 1/2 No. 48	3 No. 48	3 1/2 No. 48	4 No. 48	4 1/2 No. 48	5 No. 48	5 1/2 No. 48	6 No. 48	
	W-27"	W-41"	W-68"	W-82"	W-109"	W-123"	W-1410"	W-164"	W-1811"	W-205"	W-23"	W-246"	
5	2,600	4,350	7,000	8,700	11,300	13,000	15,600	17,350	20,000	21,700	24,300	26,000	5
5 1/2	3,200	5,300	8,500	10,500	13,750	15,900	19,000	21,150	24,350	26,400	29,600	31,700	5 1/2
6	3,750	6,250	10,000	12,500	16,250	18,700	22,450	25,000	28,700	31,150	34,900	37,400	6
6 1/2	4,350	7,200	11,500	14,350	18,700	21,500	25,850	28,700	33,000	35,900	40,250	43,000	6 1/2
7	4,950	8,100	13,000	16,250	21,150	24,350	29,300	32,500	37,500	40,600	45,500	48,750	7
7 1/2	5,500	9,000	14,500	18,500	23,600	27,200	32,700	36,300	41,750	45,350	50,850	54,500	7 1/2
8	6,000	10,000	16,000	20,000	26,000	30,000	36,100	40,000	46,150	50,000	56,150	60,100	8
8 1/2	6,800	11,000	17,600	22,000	28,600	33,000	39,500	43,850	50,500	54,850	61,500	65,800	8 1/2
9	7,500	12,300	19,800	24,600	32,000	37,000	44,500	49,500	57,000	61,500	69,000	74,000	9
9 1/2	8,000	13,300	21,300	26,500	34,500	40,000	48,000	53,000	61,000	66,500	74,500	79,600	9 1/2
10	8,500	14,200	22,800	28,500	37,000	42,500	51,500	57,000	65,500	71,000	79,500	85,500	10
10 1/2	9,000	15,200	24,300	30,300	39,500	45,500	54,500	60,500	70,000	76,000	85,000	91,000	10 1/2
11	9,700	16,100	25,800	32,200	42,000	48,000	58,000	64,500	74,000	80,500	90,500	96,500	11
11 1/2	10,300	17,100	27,400	34,000	45,500	51,000	61,500	68,000	78,500	85,500	96,000	102,500	11 1/2
12	10,850	18,000	28,900	36,000	47,000	54,000	65,000	72,000	83,000	90,000	101,000	108,000	12
12 1/2	11,500	19,000	30,400	38,000	49,500	57,000	68,500	76,000	87,500	95,000	106,000	113,700	12 1/2
13													13

Height Overall	NUMBER OF SECTIONS												Height Overall
	6 1/2 No. 48	7 No. 48	7 1/2 No. 48	8 No. 48	8 1/2 No. 48	9 No. 48	9 1/2 No. 48	10 No. 48	10 1/2 No. 48	11 No. 48	11 1/2 No. 48	12 No. 48	
	W-27"	W-28"	W-312"	W-328"	W-353"	W-369"	W-394"	W-4010"	W-435"	W-4411"	W-476"	W-49"	
10 1/2	84,000	88,500	108,000	114,000	122,500	128,000	136,500	142,000	151,000	156,500	165,000	171,000	10 1/2
11	100,000	106,000	115,500	121,500	130,500	136,500	145,500	152,000	161,000	167,000	176,000	182,000	11
11 1/2	106,500	113,000	122,500	129,000	138,500	145,000	155,000	161,000	171,000	177,000	187,000	194,000	11 1/2
12	112,600	119,500	129,500	136,500	147,000	153,500	164,000	170,500	181,000	188,000	198,000	205,000	12
12 1/2	118,000	126,000	137,000	144,000	155,000	162,000	173,000	180,000	191,000	198,000	209,000	216,000	12 1/2
13	125,000	132,500	144,000	152,000	163,000	170,500	182,000	190,000	201,000	208,000	220,000	228,000	13



PERFORMANCE CHARACTERISTICS

Type S

Cleaning Efficiency 98%
Average Operating Resistance40 W. G.
Air Velocity at Face of Filter 500 F. P. M.

Type V

Cleaning Efficiency 97%
Average Operating Resistance30 W. G.
Air Velocity at Face of Filter 500 F. P. M.

Adhesine Capacity

Filters more than 9' high Series 30 Series 48
Reservoir capacity 30 Gals. 40 Gals.
Sediment pan capacity 2 1/2 Gals. 4 Gals.

Filters more than 9' high

Reservoir capacity 45 Gals. 60 Gals.
Sediment pan capacity 3 1/2 Gals. 5 Gals.

Sediment Removal: For average dust conditions the sediment needs to be removed only four to six times a year. In steel mill service it is often necessary to empty the sediment pans once every week (evidence of the severe operating condition of this application and the ability of the Multi-Panel filter to handle excessive dust concentration,) but with the worst ventilating service, sediment removal every six weeks is ample.

Oil Replacement: Depends upon the frequency with which the sediment must be removed but under average conditions should not exceed a complete renewal annually.

Other American Air Filter Products



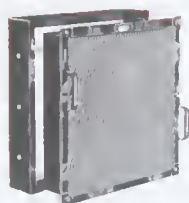
Horizontal
(Bulletin MII-2)

Automatic Air Filters

For either building or industrial ventilation and air cleaning. Self-cleaning feature places operation on purely mechanical basis, eliminating need of attention and assuring satisfactory performance at all times. Ideal for buildings where fully automatic air cleaning is desired and for industrial plants, such as steel mills, requiring continuous, uninterrupted service under heavy dust concentrations. Manufactured in the designs shown, for either continuous or intermittent service. Available in sizes suitable to desired capacity and to space conditions.



Phoenix
(Bulletin No. 250)



Standard Unit Filters

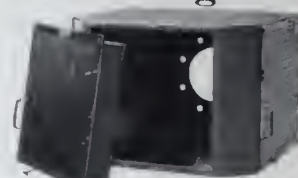
For both general building and industrial ventilation. Constructed on the unit principle, incorporating standard sheet steel frame and interchangeable cell; furnished in either expanded metal or crimped wire type filter media as required. Easily installed in either old or new ventilating systems.

(Bulletin No. 201)

Special Air Filters for Compressors and Engines

Prevents unnecessary wear, eliminates frequent valve cleaning and reduces lubricating oil consumption by keeping dust and grit from entering cylinders. Made in all sizes ready to attach to air intake.

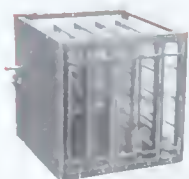
(Bulletin No. 120)



Type SCF

Airmat Dry Process Filters

Pocket Type



Developed to meet the urgent need for an efficient dry filter. Filter media of gauzy cellulose tissue, ideal for dry air filtration. Applicable to both general ventilation and industrial air cleaning, and manufactured in standard units which can be assembled to meet any desired capacity or space requirements.

(Bulletin No. 220)

Dust Arrester

Admirably adapted for the recovery of valuable dust, for abating the dust nuisance in factories and factory districts and for saving fuel and eliminating drafts due to recirculation of air in winter. Furnished in standard dust "boxes" and in dust arrester "systems" designed for individual needs.



"Dust Box"

(Bulletin No. 230)



Warm Air Furnace Filter

Placed in the cold air return eliminates dust, dirt and soot. Provides clean filtered heat for the home. Keeps walls and draperies fresh and clean all winter. Makes warm air cleaner than any other heating system at a fraction of the cost.

(Bulletin No. 115)

Window Ventilator Filters



A miniature self-contained ventilating system for small offices, laboratories, finishing rooms, etc. May be placed in window or wall opening and operated from the lighting circuit.

(Bulletin No. 116)

AMERICAN AIR FILTER CO., INC.

General Office
1125 Central Avenue, Louisville, Ky.

Incorporated
Offices in Principal Cities

Factories:
Bradford, Pa. and Louisville, Ky.

MIDWEST
TRADE MARK

Reed Air
filters ALL METAL

NATIONAL
AIR FILTERS
TRADE MARK

The Midwest Automatic

HORIZONTAL

Self Cleaning Air Filter

MIDWEST  FILTERS

MIDWEST MANUFACTURING COMPANY
BRADFORD PENNSYLVANIA

OFFICE IN PRINCETON

Midwest Mfg. Co. Copyright 1934

Licensed under American Air Filter Company Patents

Inherent

Of Construction Incorporated in the Midwest Model

A Truly Automatic Air Filter

IN THE Midwest Model H is offered a completely automatic self-cleaning air filter possessing all of the advantages of Midwest unit construction plus startling new features that mark an advanced era in all-metal air filter design.

Cleaning is entirely automatic, not simply in terms of days and weeks, but months; in fact, continuous operation without attention of any kind over a period of a year is possible on certain installations. The whole field of air filter application has been widened; dust concentrations heretofore considered impractical of treatment by filters of this type, have been handled with perfect success, and a uniformly high efficiency under wide variations of air volume has made this an all-season model of exceptional adaptability.

The tested Midwest principle of cell construction has been retained in the Model H. To this fundamental feature has been added certain other important elements of design resulting in higher efficiency and greater dust-storage capacity than has ever heretofore been obtained. The accomplishment of these results, without sacrifice of that rugged simplicity always characteristic of Midwest Unit filters and without mechanical complication, is truly an achievement in ventilating engineering.

Pre-Cleaning Eliminates Heavy Dust

One of the most noteworthy and important innovations incorporated in the horizontal filter is the simple expedient, shown in the diagram to the left, by which the filter cell proper is relieved of the burden of heavy dust and thus left free to function at *maximum efficiency at all times.*

The bulk of dust in any filter tends to accumulate at the point of entrance. In the Midwest standard unit cell, this tendency has been reduced to a minimum by scientific dust distribution achieved by viscous coated filter plates which provide a uniformly progressive increase in density from front to rear of the medium. The high efficiency thus obtained in Midwest unit cells is now augmented by baffle aprons which serve the double purpose of pre-cleaning the air of heavy dust and directing the flow at a minimum of resistance



View From Dirty Air Side

"Simple"



Welded C
Add Stren

the Trough
Bottom Aids
CLEANLY

Advantages

delivered in Unusually High Efficiency Uniformly Maintained

Horizontal Placement Increases Capacity

It is a well known fact that viscous liquids adhere in greater quantities to articles placed in a horizontal position. Inasmuch as viscous coatings provide the dust-catching medium on all filters of this type, the inherent advantages of horizontal placement are immediately apparent.

The results of this simple application of a fundamental principle of design are far-reaching. Capacity is increased; frequent cleaning and charging in the case of ordinary dust concentrations is not necessary and where continuous operation is desired, the volume and concentration of dust that can be handled is greatly in excess of anything yet accomplished by metal air filters. Large loads are handled with ease; in fact, it is seldom that this model is called upon to perform at full capacity. The result is long life and low up-keep.

Another advantage of the horizontal position is the fact that the accumulated dust is not *washed through* the filter medium, but is *washed off* instead. In any scientifically constructed filter cell, there must be a relatively large storage capacity provided on the dirty air side, diminishing in capacity, but increasing in density toward the clean air side of the medium.

Viscosine, washing down through the Midwest cell, does not force large quantities of dust through the filter plates, but encounters larger accumulations as it progresses. Cleaning is thus facilitated, and at the end of every operation there is presented to the incoming air a filter medium as perfect and efficient as the day the apparatus left the factory.

Efficiency at Reduced Load

Filters which require a definitely maintained velocity in order that dust may be impinged upon the filter medium with certain specified

force, lose in efficiency when the volume or pressure is reduced. Because of its construction and utilization of the Midwest principle of cell construction, this model will function at full efficiency under a much wider than usual range of volume and pressure. The Horizontal, running at two-thirds load, performs at practically the same efficiency as when working at specified capacity. In the Winter this is not only a great convenience; it is practically a necessity.



View From Clean Air Side

“Efficient”

Simplicity

Characterize the Operation of the

How Cleaning Is Accomplished

CLEANING of the Midwest Model "H" is accomplished by means of an electrically driven pump which feeds Viscosine through a header into flooding pipes located directly over and extending the full width of the cells. These flood pipes travel back and forth over the filter cells at a speed of 8 inches per minute during washing. The header to which they are attached consists of a seamless steel tube containing a valve with ports opening automatically and in sequence into the different flood pipes. Only one row of cells is flooded at a time, one movement back and forth across each row being sufficient for complete cleaning. The entire operation is automatic and extremely simple. The header and flood pipes move back and forth smoothly and quietly, cleaning one row after another with the expenditure of little energy.

Flooding one row at a time achieves distinct economies. It permits the utilization of small quantities of Viscosine, low current consumption and the use of 1/4 H.P. motors on even the largest models.

The slot in the pipe through which the Viscosine flows is approximately 1/32 of an inch wide. The Viscosine coming out of this pipe is not a spray but a solid curtain which washes every part of the filter medium and rises only 1/4 of an inch above the top of the cell. The same operation that cleans the filter also cleans it with Viscosine. After the washing operation, there remains upon the filter medium a fresh viscous coating which acts to trap the dust of the incoming air.

Settling Tank

The dirty cell after it has passed from the filter cell, flows down through a plate and into a collecting trough at the bottom of each filter and drains into a settling tank at the bottom of the filter frame. Here the sludge is allowed to remain for a time ranging from three to six minutes or a year, depending on the dust concentration of the air.

The tank is open and equipped with a false bottom to facilitate the removal of sludge. The capacity of the tank is approximately 20 gallons per filter cell as well.

Efficiency

The Midwest Horizontal Model "H" is 97% to 99% efficient. We guarantee that not more than five-hundredths of a grain of dust per thousand cubic feet of air will remain in the cleaned air.

Fluid Flow Filter
Intermediate Air Filter



and Economy

of the Model "H"

Intermittent Air Flow

Most applications readily permit the cleaning of the filter when the fan is shut down. This is termed "intermittent air-flow." Due to the high efficiency and dust-holding capacity of the Midwest Horizontal, unusual economies are achieved in such installations. Under normal conditions, this filter is capable of operation at full efficiency without cleaning for a period of seven days. Cleaning is then accomplished by the closing of a suitable switch energizing the motors. Only where abnormally heavy dust concentration is encountered is a time switch control required or recommended for intermittent air-flow installations. The result of this high dust holding capacity is infrequent cleaning intervals and wear reduced to a minimum, together with an unusually clean charging medium secured by reason of the fact that dust is allowed to settle over long periods of time.

High Dust Contents Easily Handled

In rare cases, exceptionally high dust content may require daily cleaning. This operation can be made fully automatic. In such installations there is no danger of the starting device setting the flushing system in operation while the fans are going due to the fact that switches are interlocked with the fan system.

Continuous Air Flow

On the filter designed for continuous air flow, a shield 8 inches wide extending the full length of each flood pipe is placed over the top of the latter. Herein is contained the principle structural difference between the continuous and intermittent models. The shield permits the Viscosine curtain to flush down through the cell unhindered by the incoming air and provides positive protection against Viscosine being drawn into the air ducts. It moves at a speed of eight inches per minute, thus permitting the Viscosine to thoroughly drain through the filter before encountering the air flow. Perfect cleaning of the cells is accomplished while the filter is in full operation. Regulation is secured by electrical operating equipment suitable to the particular conditions involved.

Resistance

Resistance is constant at 0.34 inches water gauge on intermittent air flow and 0.25 inches on continuous air flow when the filter is operated at specified capacity.



Flood Pipe and Shield For Continuous Air Flow

Details of

The Model "H" Is Easy

Standard Set-Ups

SIMPLICITY characterizes the construction of the Midwest Model H throughout. It is built in standardized steel frames containing standardized and interchangeable cell units. The cells are laid side by side and in tiers one above another, thus permitting great adaptability in meeting varying space requirements. Where necessary, fractional cells in $1/4$, $1/2$, and $3/4$ size are used, to permit further adaptability to space conditions and air flow.

The minimum standardized set-up is one cell wide by two cells high. The maximum standardized set-up is 10 cells wide by 8 cells high. Installations calling for this model in set-ups of more than 10 cells wide by 8 cells high are answered with additional standardized frames to the number required. Such installations consist of two or more entirely separate set-ups, including all accessories with exception of electrical control apparatus; the various standardized frames being connected as one complete filter.

Capacity

Cells are rated at 1200 c.f.m. each on continuous air flows and 1500 c.f.m. each intermittent air flows

Dimensions

The size of the filter is determined by the number of cells, which, in turn, is arrived at by dividing the total amount of air (c.f.m.) by the cell capacity listed above. Once the number of cells has been found, their arrangement is governed by the space available. The over-all dimensions of any installation can be worked out from the tabulation appearing at the bottom of the blueprint on the preceding page.

For example, the dimensions of a set-up five cells wide by four cells (tiers) high, would be arrived at by locating in row "Numb. of cells", the desired number in width under which would be given, in row "Width A", the corresponding dimension, namely, 9 feet 4 3/4 inches. In the same manner, to find the height of four tiers, locate the figure "4" in row "Numb. of cells", under which will be found, in row "Height B", the correct measurement; namely, 8 feet 9 inches

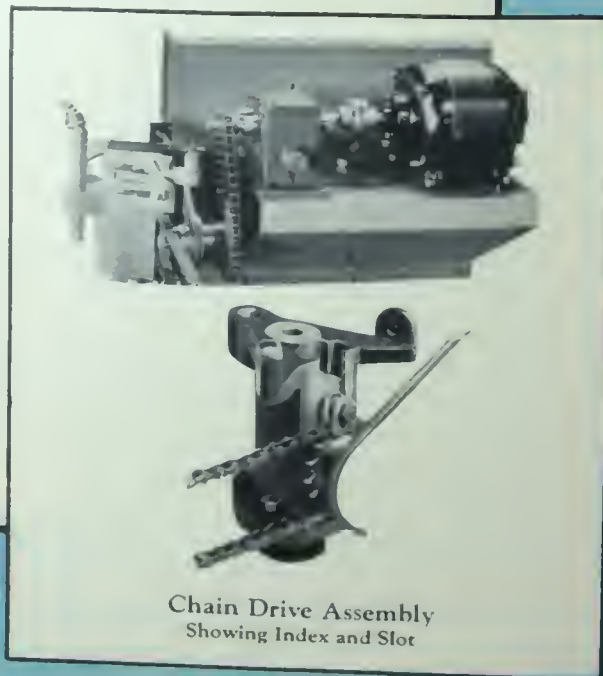
Filter Cells

Standard cells measure 29 inches long by 19 5/8 inches wide, with a filter medium 2 1/2 inches thick contained in a cell frame measuring 31 1/8 inches in depth over all. One-quarter cells are 4 7/8 inches wide, one-half cells, 9 7/8 inches wide; three-quarter cells 14 7/8 inches wide

Dust storage capacity averages 40 pounds per filter cell in width, that is, no attention of any kind in the way of cleaning is necessary until an average of 40 pounds of dust have accumulated per filter cell in width



Bronze Viscous
Gear Pump
Hard
Valves



Chain Drive Assembly
Showing Index and Slot

"Economical"

Construction

Specify and Easy to Install

Viscosine

VISCOSINE is of standard Midwest quality, the same that has been used for years for charging Midwest standard unit cells with unequalled satisfaction. At ordinary temperatures it is an odorless, non-volatile and non-inflammable liquid which flows freely, leaving upon the filter plates an efficient viscous coating which acts to trap the dust of the incoming air.

Viscosine is ejected by the flooding pipes at the rate of eight to ten gallons per minute. The use of so large a quantity naturally results in a complete, adequate flush, made possible by the specially designed header which permits only one row of filter cells to be flooded at a time. Perfect cleaning is assured under even the most severe conditions.

Viscosine consumption per year is exceedingly low, due to the fact that no more Viscosine is lost in removing dust from the settling tank than is absorbed by the body of this dust itself. Here, again, the benefit of an efficient filter medium possessing great dust holding capacity, reflected in infrequent cleaning intervals, is seen in the settling and separation of dust from Viscosine in the settling tank.

Motors

Chain drive motor for moving the flooding pipes over the filter medium is $\frac{1}{6}$ H.P. Pump motor $\frac{1}{4}$ H.P. All wiring diagrams are furnished immediately upon the receipt of advice as to current characteristics. Standard starting devices are used in all models unless otherwise specified.

Shipping and Installing

Filters are prepared for shipment assembled, crated and skidded, or parts are numbered for assembly as conditions may dictate. In the latter case they may be set up by any mechanic on the job. Complete installation instructions are provided, together with blue prints which show the assembled filter.

Specifications for Horizontal Type Air Filters

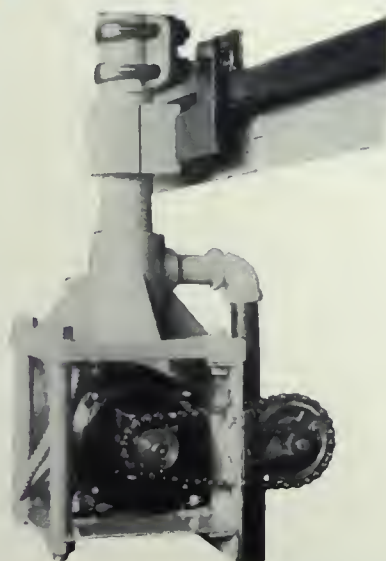
Furnish and install complete and ready to operate, a Horizontal Self-Cleaning Air Filter as manufactured by Midwest Manufacturing Company, Bradford, Pa., for (Intermittent)

(Continuous).....air flow,

to provideC.F.M. of
clean air. The installation shall be arranged

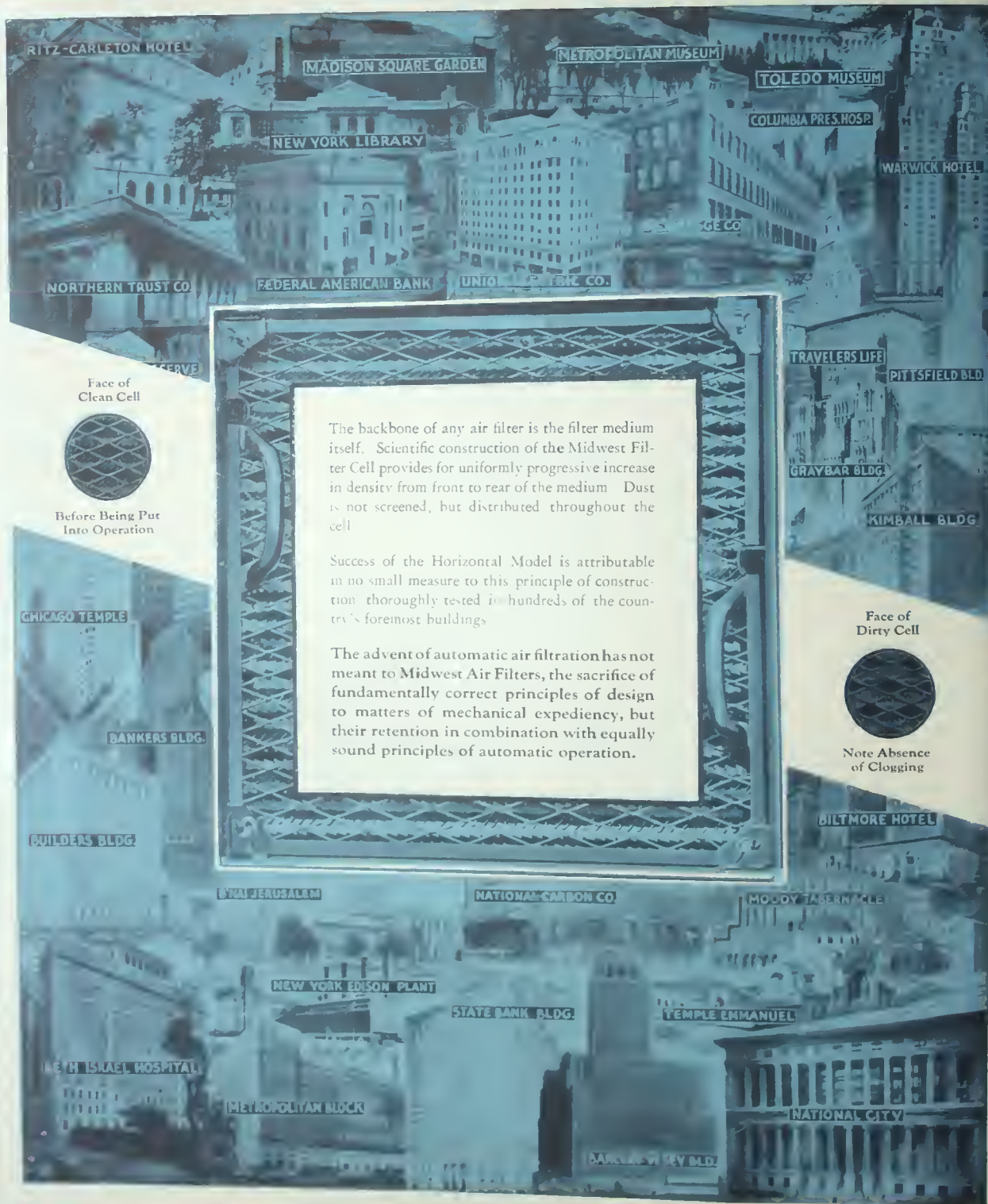
.....wide byhigh,
complete with all accessories. (Push button)

(Automatic)operation is desired.



Pump Assembly
Showing Cast Iron Housing

"Durable"



Face of
Clean Cell



Before Being Put
Into Operation

The backbone of any air filter is the filter medium itself. Scientific construction of the Midwest Filter Cell provides for uniformly progressive increase in density from front to rear of the medium. Dust is not screened, but distributed throughout the cell.

Success of the Horizontal Model is attributable in no small measure to this principle of construction thoroughly tested in hundreds of the country's foremost buildings.

The advent of automatic air filtration has not meant to Midwest Air Filters, the sacrifice of fundamentally correct principles of design to matters of mechanical expediency, but their retention in combination with equally sound principles of automatic operation.

Face of
Dirty Cell



Note Absence
of Clogging

AMERICAN AIR FILTERS

Unit Type



AMERICAN AIR FILTER COMPANY, INC.

INCORPORATED

MIDWEST
TRADE MARK

Reed Air
filters ALL METAL

NATIONAL
AIR FILTERS
TRADE MARK

GENERAL OFFICES

AMERICAN

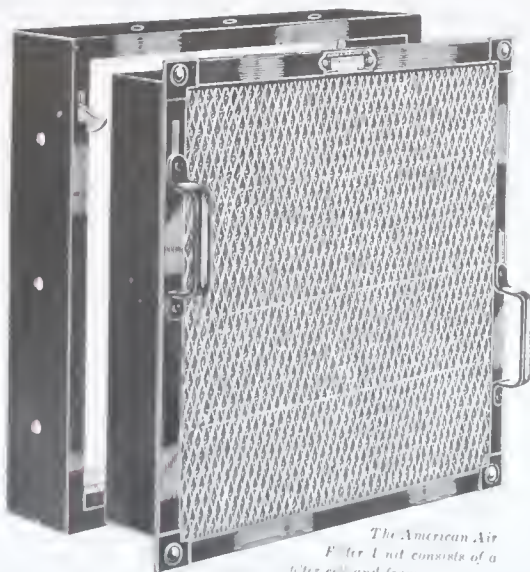
LOUISVILLE, KENTUCKY

A. I. A. FILE 30-D-3

AMERICAN *Unit Type* AIR FILTERS

for General Ventilation and Industrial Air Cleaning

IN the American Unit Air Filter are offered the outstanding construction advantages of the well-known Midwest and Reed type unit air filters. Both of these latter models have proven



The American Air Filter Unit consists of a filter cell and frame.

their worth on thousands of installations and are today recognized as the most effective unit air cleaners on the market. By incorporating in the design of the American Unit Filter the best features of each, a cleaning device unsurpassed in cleaning efficiency, ease of handling and economy of maintenance is made available.

Cleaning Principle

Cleaning is accomplished on the adhesive-impingement principle of dust elimination. Densely packed layers of viscous-coated metal baffles or crimped wire, inserted in the path of the air, force the latter to change direction and bring centrifugal forces to bear on the heavier-than-air dust particles, driving them against the viscous surfaces of the filter media where they are caught and held.

Filter Media

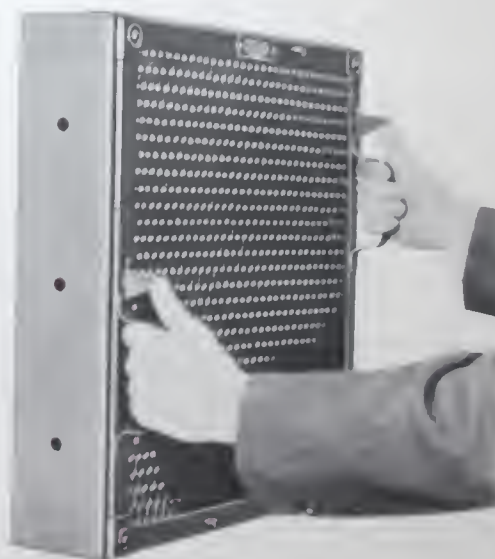
The filter media is the most important part of an air cleaning device, its construction determining cleaning efficiency, resistance—in fact, the operating

efficiency of the entire filter. Both the Reed type crimped wire and the Midwest type expanded metal filter media were developed to their present stage of efficiency after years of research and experimentation on the part of leading engineers in this field. Their retention in the American Unit Filter, and the use of each for purposes to which it is particularly adapted, assures a higher standard of air cleaning than has ever before been possible in a device of this kind.

The filter media in the American Unit Filter is packed with progressive increase in density from front to rear of the cell. Voids are thus provided at the front of the cell for the accumulation of large quantities of dust while the denser media at the rear are left free to trap the finer dust particles. This distributes the dust evenly throughout the entire cell—one of the chief reasons for the high cleaning efficiency, the low resistance, and the longer continuous operation of this filter.

Unit Principle of Construction

The American Unit Filter consists of a standard steel frame and interchangeable cell. The cell fits



Slight pressure of thumbs on automatic latches releases cell for cleaning and recharging.

snugly in the cell frame, felt gaskets on the latter assuring air-tight contact at all points. Removal of the cell for cleaning and recharging is easily and quickly accomplished by the aid of automatic latches placed conveniently near the handles. As the cell weighs only 20 lbs. it is extremely light and easy to handle. Because of the narrow construction of the filter frame, a relatively large effective cleaning area is offered to the air flow.

How to Determine the Number of Units Required

An installation is built up of the required number of units arranged in a manner suitable to the space available.

800 C. F. M. is the normal rating of an American Air Filter Unit. To determine the number of units required for any ventilating job, therefore, simply take the total amount of air to be cleaned and divide it by 800 C. F. M. Thus, $24,000 \text{ C. F. M.} \div 800 = 30$ units required. Ordinarily, fractions of units should be considered as units. For instance, $21,000 \text{ C. F. M.} \div 800 = 27$ units required.

One spare cell should be added for every five active units, to take the place of dirty cells when they are removed for cleaning and recharging.

Planning the Shape of an Installation

The simplest and the best way of installing American Unit Filters is to arrange them in the form of a wall between the source of dusty air and the air ducts, with the front or handle side of the filter facing the dirty air supply. Where space is limited, however, there are a great many ways in which the required number of units may be set up,



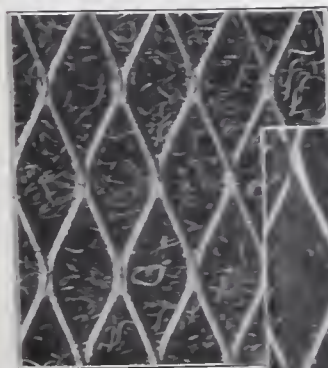
Removing cell for cleaning. The spare cell on the floor is cleaned and changed ready to replace the dirty cell, thus maintaining an interrupted service.

some of which are illustrated on the following page. In "staggering" the units, the angle of the duct connection between filter and fan should never be less than 45° .

By bolting the frames together, a rigid, leak-proof installation can be assured. The filter frames are drilled with 7 $\frac{1}{16}$ " bolt holes, three on each side, for this purpose and also to facilitate making sheet metal connections. Where the units are placed at right angles, or "staggered", special angle irons can be furnished for bolting the frames together.

A clearance of at least two or three feet also should be left on the dirty air side of the installation to facilitate removing cells. If there is not enough space for this, "REVERSE CELLS", with the filter media reversed, may be obtained, and cells removed on the clean air side. It should be remembered that the filter media in the American Unit Filter is progressively graded; therefore to place the filters in reversed position without using reversed cells means failure to obtain the operating efficiency for which the unit is intended.

The American Air Filter representative in your vicinity is always ready to help you lay out an air filter installation and if you are in doubt about any phase of the problem, please call on him.



At left, close up view of fast clean American Air Filter cell, with galvanized crimped wire media.

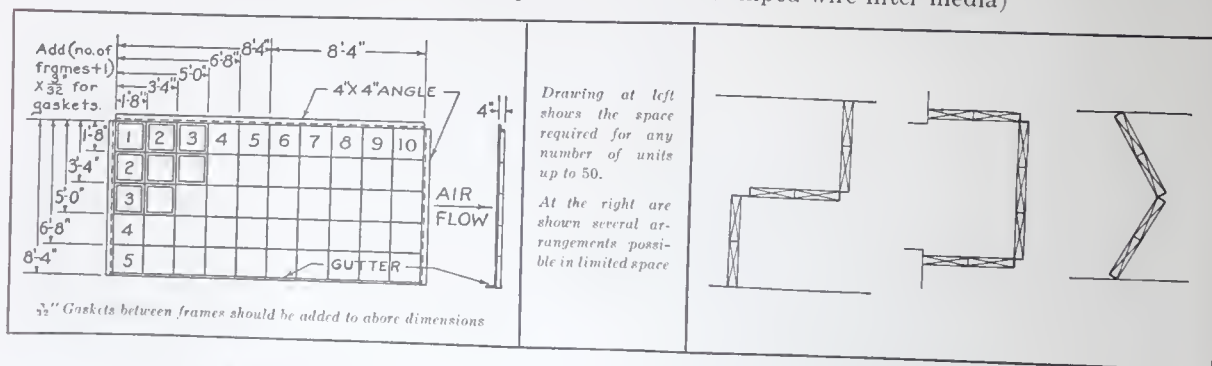


Right, close up view of clean American Air Filter cell, with expanded metal media.

Engineering Data

Rated Capacity.....	800 C. F. M.	Effective Opening.....	18"x18" (2 $\frac{1}{4}$ sq. ft.)
Overall Dimensions.....	20"x20"x4"	Weights.....	Cell, 20 lbs.—Frame 10 lbs.
Air Velocity through Filter.....	355 F. P. M.	Dust Holding Capacity.....	2 lbs.
Resistance to Air Flow		Cleaning Efficiency	
Type A (Bacteria Filter)25" w. g.	Type A.....	...99 + %
Type B (Standard Filter)18" w. g.	Type B.....	...97%
Type C (Low Resistance)12" w. g.	Type C.....	...95%

(Furnished with either expanded metal or crimped wire filter media)



Maintenance

The only maintenance cost on a standard American Unit Filter installation is the routine cleaning and recharging of the cells. One man, on a relatively negligible part of his time, can take care of the small amount of work involved.

Cleaning Efficiency

The American Unit Filter is guaranteed to remove 97% of all the dust, soot and bacteria passing through it. Numerous tests made by unbiased engineers have shown a cleaning efficiency, under actual operating conditions, in excess of 99%.



Charging tank showing filter cells draining after being immersed in charging liquid. On large installations drain racks are furnished.

Where Used

American Unit Filters are used wherever clean air is required—for general ventilation; for the ventilation and cooling of electrical machinery; motors, generators, etc.; for drying operations and bacteria control; for air compressors and internal combustion engines; for warm air furnaces; and for industrial processes requiring dust-free air. The more important of these applications are explained in detail on the following pages.



Steam Cleaning Tank cleans the dirtiest filter cell perfectly in less than two minutes. Will operate satisfactorily on any steam pressure from 2 lbs. up to 150 lbs.

American Air Filters

— for General Building Ventilation

FORMERLY conditioning or cleaning the air was considered only in connection with large ventilating systems, but the constantly increasing amount of atmospheric impurities, together with a better understanding of the importance of filtered air in the maintenance of health and personal efficiency and in the preservation of valuable merchandise and equipment, has extended its use to even the smallest and most ordinary ventilation.

The principal advantages of the American Unit System of Air Filtration are its simplicity, high cleaning efficiency and flexibility. Being designed as a unit, the American Unit Filter can be arranged to meet the required capacity and yet conform to the space available. It can be applied to existing ventilating systems as well as new ones, and may be used equally as well in the ventilation of an entire building or a single room.

In the ventilation of office buildings, schools, hotels, restaurants, theatres, and buildings of this type, American Air Filters have proved invaluable in providing high standards of health and cleanliness, and in reducing cleaning and redecorating costs—the savings thus obtained often paying for the installation itself within a short period of time.

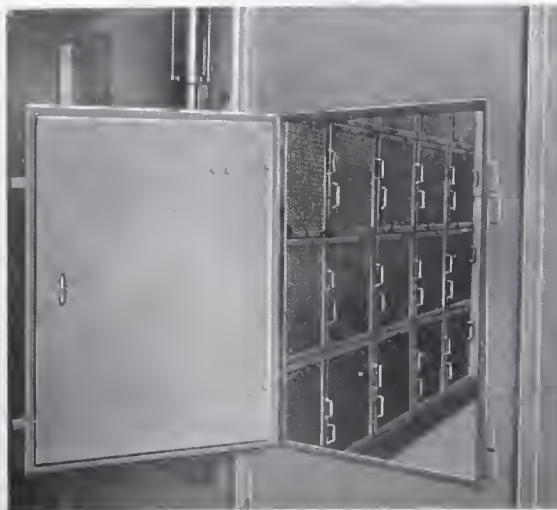


An overhead installation of American Air Filters in the office of a large Department Store, supplying filtered, dust-free air without sacrificing valuable floor space.

American Air Filters now in operation are cleaning well over 100,000,000 cubic feet of air per minute. The installations vary in size from a single unit ventilating a small laboratory to several hundred units purifying the air for great department stores, schools, factories, office buildings, hospitals, theatres and hotels.



One section of the 465 American Air Filter Units in the Chicago Union Station



American Air Filters installed in an abandoned air washer casing

— for Electrical Ventilation



Model No. 100, American Air Filter Company, Inc., New York, N. Y.

FILTERED air for the ventilation and cooling of modern electrical equipment is receiving greater consideration today than ever before due to the increased amount of heat, coal dust and other undesirable impurities which enter into the air. Heat and coal dust, being carbons, are conductors of electricity and if allowed to deposit on windings or insulators in sufficient quantities will cause short circuits. At the same time, being non-conductors of heat, every little deposit will prevent the proper dispersion of heat and cause increased temperatures.

Operation of electrical equipment that in modern air cleaning devices provides a most economical method of insuring the absence of dust, dirt, etc., and of increasing the capacity of that equipment. Installing an air filter and running between 97% to 99% clean air to motors, generators, etc., creates a substantial increase in the operating load that may be safely carried and frequently saves the purchase of additional power equipment.

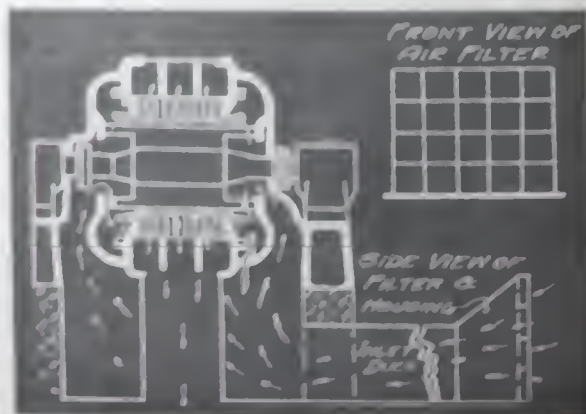
The high efficiency of American Air Filters in the removal of surface impurities from the air is not reason for its wide use in the electrical field. The vacuum-charging liquid used in American Air Filters has a strong affinity for all carbons, forming an emulsion with the dust, coal dust, etc., and leading to security in the filtering media.

The adhesive-impingement system of air filtration, being a viscous process using no water, does not increase the moisture content of the air, and is, therefore, applicable to all types of electrical ventilation. Its high efficiency in the elimination of all dust, dirt, and especially carbons makes it particularly well suited for this service.

The extensive use of American Air Filters in the iron and steel industry points significantly to the increasing importance attached to this equipment. Practically every large steel mill now uses American Air Filters to supply clean air to mill motors and generators. Installations in this industry alone total over 15,000,000 C. F. M. Many plants have as many as twenty or thirty large air filter installations and are constantly

sending in repeat orders. Owing to the nature of the air cleaning required in steel mills and to the fact that air filters must be operated continuously, 24 hours a day, the automatic, self-cleaning type of equipment, described briefly on the following page, is usually used for this service.

Besides their use in connection with mill motors and generators, American Air Filters are used to provide clean FILTERED air for the ventilation of rotary converters, voltage regulators, bus galleries, substations, automatic telephone exchanges, and all other electrical equipment requiring protection from dust and grit.



Model No. 100, American Air Filter Company, Inc., New York, N. Y.

— for Drying Operations and Bacteria Control

FOR drying such materials as Milk, Gelatin, Glue, Butter, Eggs, Fruits, Starch, Cereals, Laundry Work, Paper, Prints, Wools, Yarn, Cotton, Chemicals, Paints, Varnishes, etc., the American system of air filtration has many distinct advantages.

It supplies pure, FILTERED air without detracting from its drying effectiveness and at the same time removes and destroys all air bacteria, molds and other minute fungi which yearly cause losses of enormous quantities of valuable products.

The drying of such finishes as paint, enamel, varnish, etc., may be greatly accelerated by the proper ventilation of drying rooms or ovens with FILTERED air. Bringing clean, fresh air in contact with the work and exhausting the fume-laden air will materially lessen the time required for drying and in return reduce the cost of this operation.

When spray guns are used to apply the finish the compressed air should be clean and dry. An American High Pressure Filter, placed in the air line, will clean the air and remove the entrained oil and moisture, greatly increasing, also, the efficiency of the compressor.

Spray booths equipped with exhaust fans to carry the surplus spray and fumes outside the building sometimes present a problem due to the paint spray



Above—American Air Filters installed in a large paper mill for protecting quality of paper. Center—Installation in a well-known food products plant, where filtered air reduced the bacteria count 99.6%. Below—one of 72 units of American Air Filters in drying rooms of large automobile manufacturer.



depositing on the fan blades, clogging up the ducts and creating an unsightly appearance by settling over the outside of buildings and surrounding area. Through the use of American Unit Filters, the excess spray can be filtered out of the air before it is exhausted.

In the manufacture of paper, also, American Air Filters perform a very valuable function, their use eliminating the danger of paper being spotted from atmospheric and process dust and assuring uniformly high quality in the finished product.

There are many other applications where American Air Filters can be used to advantage in connection with drying operations and bacteria control. Our Research Department will be glad to submit data and suggestions on your particular requirements.

Other American Air Filter Products

Automatic Air Filters



Multi-Panel

(Bulletin No. 240)

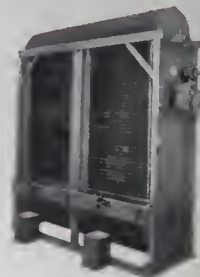
For either building or industrial ventilation and air cleaning. Self-cleaning feature places operation on purely mechanical basis, eliminating need of attention and assuring satisfactory performance at all times. Ideal for buildings where fully automatic air cleaning is desired and for



Horizontal

(Bulletin MII-2)

industrial plants, such as steel mills, requiring continuous, uninterrupted service under heavy dust concentrations. Manufactured in the designs shown, for either continuous or intermittent service. Available in sizes suitable to desired capacity and to space conditions.

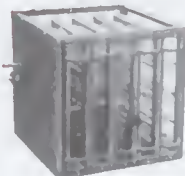


Phoenix

(Bulletin No. 250)

Airmat Dry Process Filters

Pocket Type



(Bulletin No. 230)

Developed to meet the urgent need for an efficient dry filter. Filter media of gauzy cellulose tissue, ideal for dry air filtration. Applicable to both general ventilation and industrial air cleaning, and manufactured in standard units which can be assembled to meet any desired capacity or space requirements.

Dust Arrester



"Dust Box"

(Bulletin No. 220)

Admirably adapted for the recovery of valuable dust, for abating the dust nuisance in factories and factory districts and for saving fuel and eliminating drafts due to recirculation of air in winter. Furnished in standard dust "boxes" and in dust arrester "systems" designed for individual needs.

Special Air Filters for Compressors and Engines

Type SCF

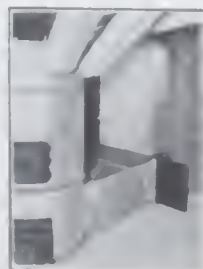


Prevents unnecessary wear, eliminates frequent valve cleaning and reduces lubricating oil consumption by keeping dust and grit from entering cylinders. Made in all sizes ready to attach to air intake.

(Bulletin No. 210)

Type "E"

A small compact filter for portable or stationary compressors, oil or gas engines, tractors, trucks, etc. Made in 5 sizes from 25 to 450 C. F. M.



Warm Air Furnace Filter

Placed in the cold air return eliminates dust, dirt and soot. Provides clean filtered heat for the home. Keeps walls and draperies fresh and clean all winter. Makes warm air cleaner than any other heating system at a fraction of the cost.

(Bulletin No. 115)

Window Ventilator Filters



A miniature self-contained ventilating system for small offices, laboratories, finishing rooms, etc. May be placed in window or wall opening and operated from the lighting circuit.

(Bulletin No. 116)

AMERICAN AIR FILTER CO., INC.

General Office
1001 and Central Avenue, Louisville, Ky.

MIDWEST
TRADE MARK

Incorporated
Office in Principal Cities

Reed Air
filters
ALL METAL

Factories
Bradford, Pa. and Louisville, Ky.

NATIONAL
AIR FILTERS
TRADE MARK

AIRMAT *Dry Process* FILTER

for GENERAL VENTILATION AND
INDUSTRIAL AIR CLEANING

A
I
R
M
A
T



AMERICAN AIR FILTER COMPANY, INC.

INCORPORATED

MIDWEST
TRADE MARK

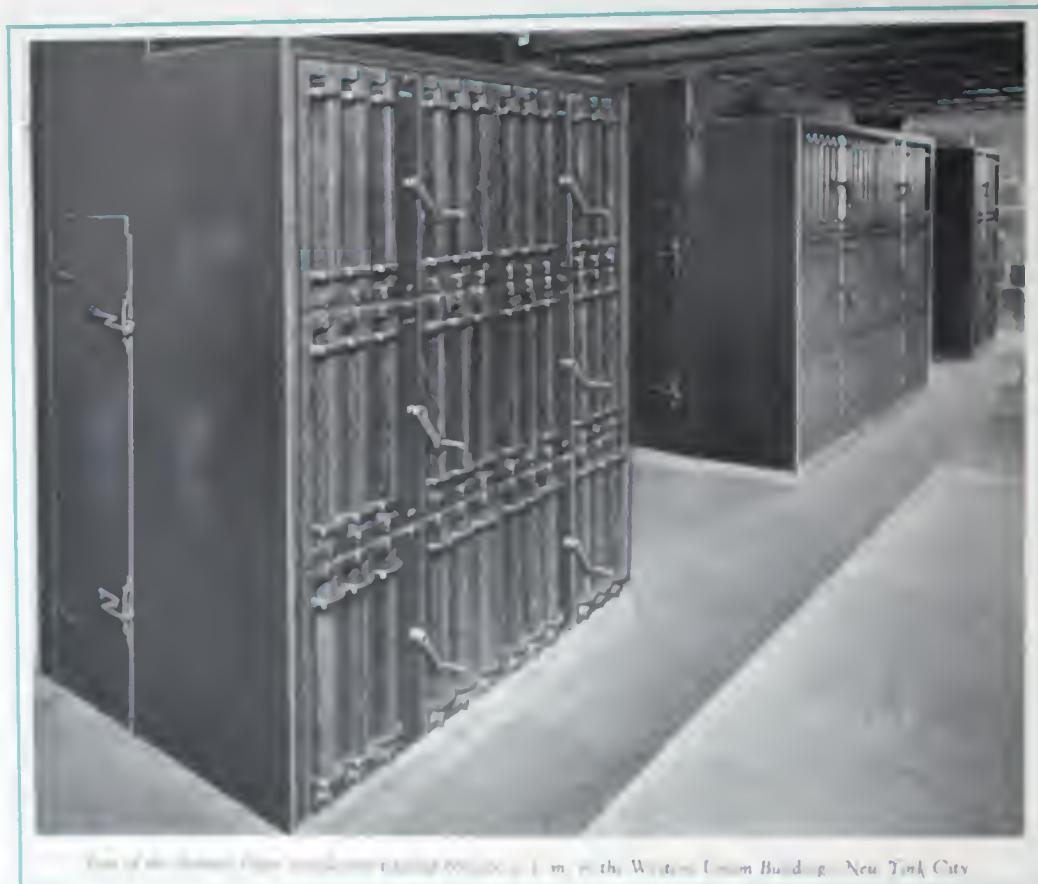
Reed Air
filters ALL METAL

NATIONAL
AIR FILTERS
TRADE MARK

GENERAL OFFICES



LOUISVILLE, KENTUCKY



View of the cleanest paper mill in the United States, a 1.5 m. by the Western Union Building, New York City

The AIRMAT Dry Process AIR FILTER

POCKET TYPE

for General Ventilation and Industrial Air Cleaning

THE AIRMAT FILTER, developed more than two years ago to meet the urgent demand for an efficient and economical method of dry filtration, has thoroughly demonstrated its practicality and is now being widely used in general ventilation and industrial air cleaning.

Early experiments in dry air cleaning showed that no available filtering material could possibly meet the space requirements and operating characteristics established by the vacuum type filter, making it necessary to create an entirely new dry filtering medium—Airmat.

Airmat is an intermediate product in the

processing of spruce wood fibres to make cellulose, the basis of Rayon—thus, while neither paper nor cloth, it has characteristics of both which make it an ideal filtering medium. The Airmat sheet, a felt like mat composed of layers of gauzy cellulose tissue, is so basically different—so unlike any other material that it is difficult to describe.

The photomicrographs on the next page clearly illustrate the maze of tiny fibres in a single ply of Airmat. Six of these plies, held loosely together by embossing, form the mat used for average purposes. The plies are so thin



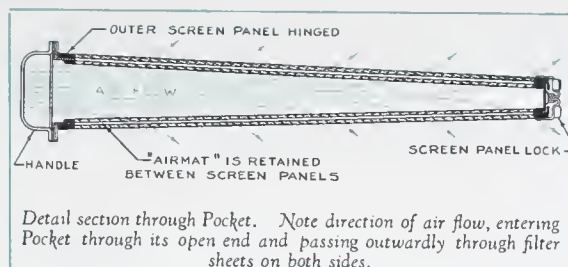
Inserting "Airmat" Sheet in one of the Holders on the Pocket

that this six ply mat is only about $\frac{1}{8}$ inch thick. The material is so light that the 4 square feet in each sheet weigh but $1\frac{1}{4}$ ounces.

One outstanding advantage of this type of filtering media is that it is so easy to change and inexpensive to renew that the cost of elaborate reconditioning apparatus

is eliminated. The air to be cleaned is made to pass through this sheet at low velocity. The countless tiny openings in the material permit the air to pass with very little resistance, but the slow movement and tortuous path taken cause the air to leave behind all dirt particles in the mazes of the fibrous mat. The special chemical treatment given the Airmat material adds greatly to its natural cleaning efficiency and gives it remarkable ability to withstand atmospheric moisture.

Whenever the resistance to air flow reaches the allowable maximum, due to the accumulation of dust, the Airmat sheet is reconditioned by vibrating—or replaced with a new one.



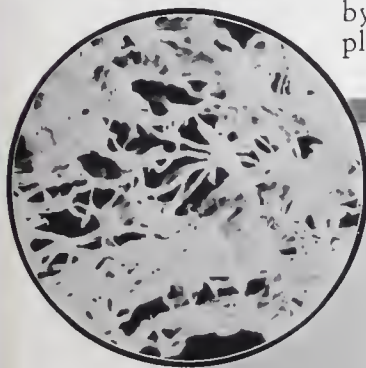
Detail section through Pocket. Note direction of air flow, entering Pocket through its open end and passing outwardly through filter sheets on both sides.

The Airmat Pocket

THE Airmat Sheet is supported by a specially designed holder called a "Pocket". This pocket is tapered in shape, allowing for uniform distribution of air over the surface of the sheet. Air enters the pocket through its open end and passes outward through the sheets on either side. This keeps the dirt on the inside of the pocket from which it is easily removed when the pocket is taken out to change the sheets. The pockets are provided with handles and simple spring latches to hold them securely in the frames against felt gaskets to prevent air leakage.

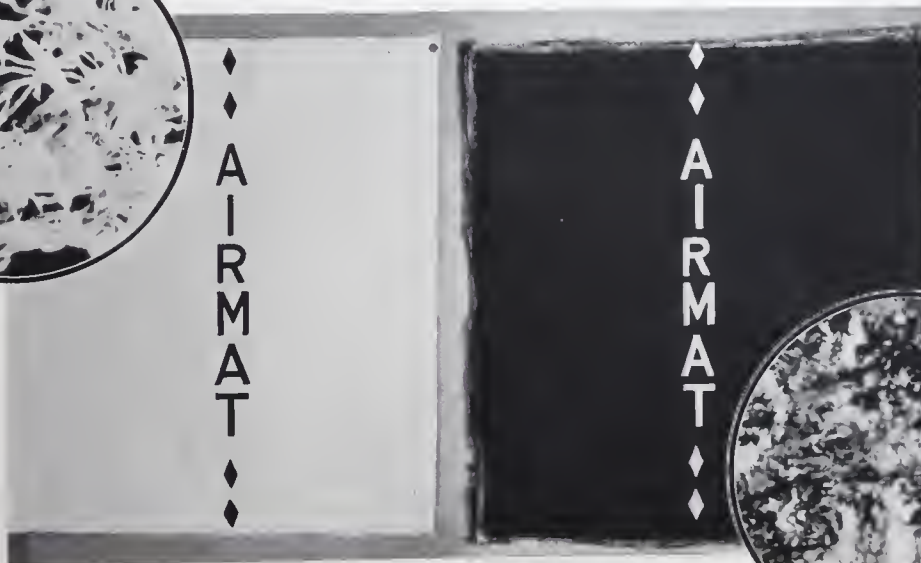
The construction of the pockets, while light, is rigid enough to withstand a great deal of handling. The life of a pocket should be almost indefinite.

The Airmat sheets are supported between screen panels, the outer one of which is hinged, making it a simple and easy operation to renew the sheets.



Clean sheet of AIR-MAT ready for service.

Above: Photomicrograph (by R. W. Hunt & Co., of Chicago) of a single ply of this clean sheet.



Sheet of AIRMAT after service in filter.

Below: Photomicrograph (by R. W. Hunt & Co., Chicago) showing dirty particles in the mazes of the AIR-MAT fibres.



Fig. 6 — Unit Frame, Style No. 50, with five Pockets and Vibrator Bar. View taken from Air Inlet side.

The Filter Unit

THE Filter Unit is a framework of standardized size—an exact cube measuring 2 feet 3 inches in all of its outside dimensions. The pockets described on the previous page, fit into this frame and are held firmly in position against a felt seal by spring locking devices top and bottom. The frame, with its five pockets, is considered a standard Filter Unit. These unit frames can be built up and bolted together to fit almost any space available, and to take care of any desired air volume.

The maximum rated capacity of an Airmat unit is 1750 c. f. m. On this basis, each of the five pockets in the unit will handle 350 c. f. m. Each of the two Airmat sheets in a pocket will handle 175 c. f. m. The velocity of the air passing through the sheet will thus be about 45 lineal feet per minute.

Obviously the rating is more or less flexible depending on the dust content of the air and the number of hours daily service but should never exceed 1750 c. f. m. Where the air is unusually dirty or where the hours of daily service are long the rating should be dropped to 1500 c. f. m. per unit. In case both conditions are present in the same job the rating should be lowered to 1200 c. f. m. or less.

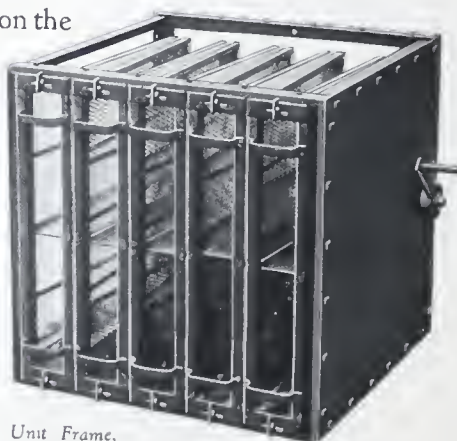
The Vibrator

THE Vibrator is a device for shaking or vibrating the pockets to free the Airmat sheets of excess dirt. It is operated at intervals, governed by the rate at which the dirt accumulates. The effect is to reduce the resistance through the sheets, so that their useful life is extended. After several such operations the sheets must be removed and clean ones substituted.

The useful life of the sheets will vary directly with the dust content of the air, and the hours of daily service. A life of ten weeks is not unusual in general ventilation systems under ordinary dust and duty conditions. This period might be considerably extended under favorable conditions or reduced under severe ones. Airmat sheets are inexpensive, so that the cost of renewals is negligible as a factor in maintenance. The process of servicing is so simple and convenient that there is no tendency for the caretaker to neglect the duty.

All of the Filter Units are equipped with a sliding bar to which are attached five stirrups, or grips, into which the closed ends of the pockets fit loosely. The Vibrator is mounted on a heavy steel plate, which in turn is bolted to the side of the End Unit in each horizontal row. When the handle is

turned at moderate speed a snapping action is transmitted to all the pockets in that row.



Unit Frame, Style No. 51—front view. Note Vibrator mounted on heavy steel plate bolted to end of frame.

Unit Frame, Style No. 51—rear view. The Vibrator transmits its action to all pockets in the same horizontal row, thus freeing the "Airmat" sheets of excess dirt.

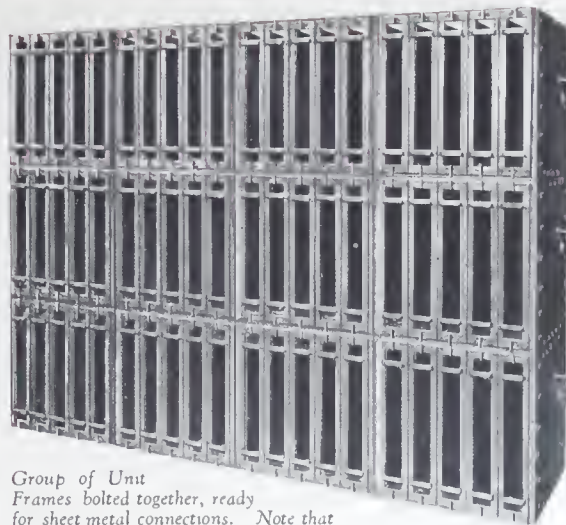


One Vibrator is sufficient for as many as four Unit Frames in one horizontal row. When the group is more than four frames wide it is necessary to use a Vibrator at each end of the row. In that case, the center frames in the row are separated by a parting strip $\frac{3}{8}$ inch thick, so that the sliding bars of each end will not come in contact.

Our standard arrangement is to place the Vibrator at the right end of the group—when facing the same direction as the air flow. However, if this arrangement is not feasible, the filter units can be reversed so that the drive is at the left end. Obviously, we must always know how the frames are to be assembled in order to provide the right number of Vibrator Units.

The Assembly

THE Assembly of Filter Units into a complete Filter is a simple operation. The pockets are first removed so that the Frame can be more readily handled. The frames are built up in the form of a wall and bolted



Group of Unit Frames bolted together, ready for sheet metal connections. Note that one Vibrator Unit (Style No. 51) is located at the right end of each horizontal row of frames.

together. In doing so it is advisable to apply putty to the adjacent edges of the frames so as to form a seal against air leakage. Special putty is furnished for this purpose.

When the assembling and bolting is completed, the result is a very rigid framework. The sheet metal connections of the duct work are made directly to the outside of the filter framework, which is provided with holes for that purpose. The

sheet metal enclosure should extend to the front of the frames covering the sides and top of the filter. A typical installation, showing connections to the duct work, is shown in diagram form on page 6.

The end unit of each horizontal row will be equipped with a Vibrator. The plate on which it is mounted closes that end of the row. The sheet metal enclosure is attached to each side of this plate—holes being provided for the purpose. The Vibrator handles will thus be on the outside of the enclosure, making it unnecessary to go inside to do the vibrating.

Alternates

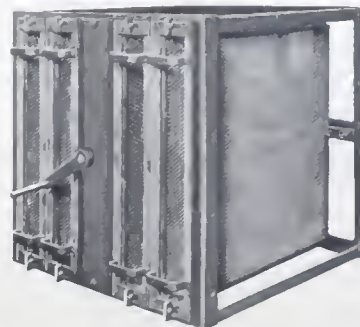
UNIT No. 52 (shown below) is provided with Vibrator attached to the rear side of the unit frame. It is used as a substitute for No. 51 to accommodate installations having no room for the Vibrator outside the casing.



Unit Frame, Style No. 52. In this style the Vibrator is located at the rear of the frame and is operated from the outlet, or clean air, side of the filter.

Unit No. 53 (shown at right) has the Vibrator attached to the front side of the

unit frame. It is used in cases where the vibrating must be done on the incoming, or dirty air, side of the filter. In this style the shaft of the Vibrator is extended and is supported by a plate which takes the place of the center pocket of the unit. One pocket is thereby sacrificed in each horizontal row of frames.



Unit Frame No. 53. In this style the Vibrator is located at the front of the frame, and is operated from the intake, or dirty air, side of the filter.

AIRMAT POCKET TYPE FILTER

1. Dimensions show overall height and width of any arrangement of Airmat units.
2. The figures in the squares show the maximum capacity in c. f. m. for the total number of units included within the coordinates of that square.
3. Three (3) units high is the maximum that can be reached conveniently for removing pockets. Installations should be kept within this height unless limited space makes it necessary to go higher.
4. Standard location of vibrator is at the right, when facing the air-entering side of the filter. When necessary to locate vibrator at the left hand side merely turn all frames upside down. If no space is available for vibrators at end of filter use No. 52 or No. 53 Units.
5. One Vibrator can handle a maximum of four (4) units—one No. 51 and three No. 50 units. When filter is five to eight units wide use two vibrators for each horizontal row, one at either end of the filter. A vertical spacer is provided as shown in diagram to separate the two sections of frames handled by each set of vibrators.

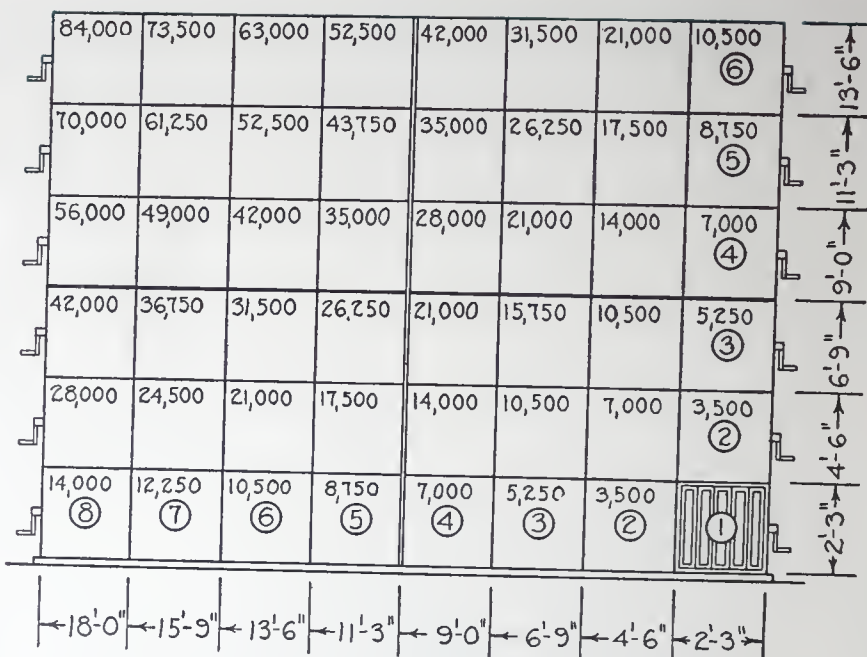


DIAGRAM SHOWING OVERALL DIMENSIONS AND MAXIMUM CAPACITIES.

SLOPING SIDES PERMISSIBLE
BEHIND FILTERS

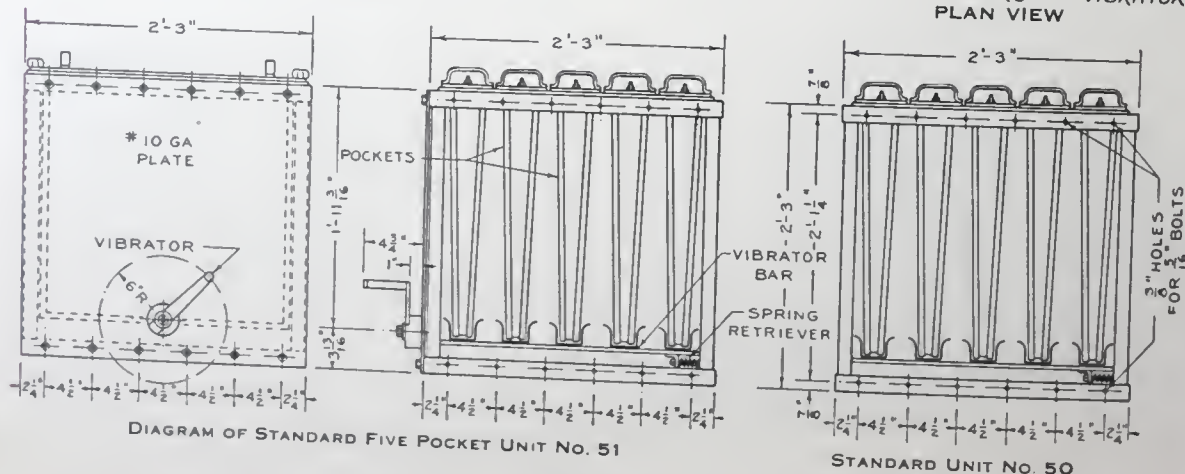
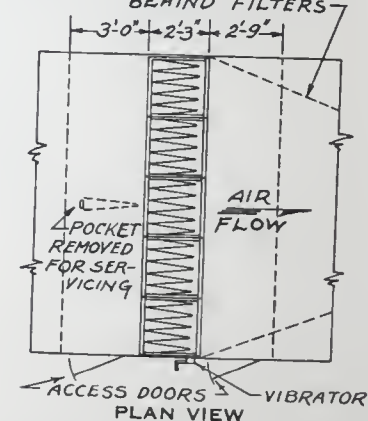


DIAGRAM OF STANDARD FIVE POCKET UNIT NO. 51

STANDARD UNIT NO. 50

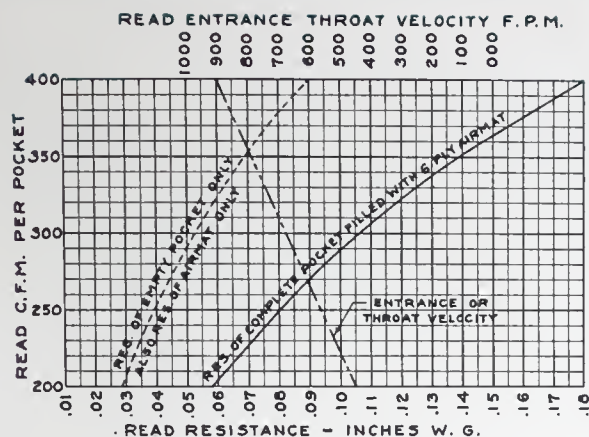


Diagram showing how initial resistance varies with volume of air passing through pocket.

Suggested Specifications

THE Airmat Pocket Type Filter, as made by American Air Filter Co., Inc. Louisville, Ky., shall be furnished and installed in accordance with instructions provided by manufacturer. Capacity rating used shall be as recommended by manufacturer and shall not exceed 1750 c. f. m. for each five pocket filter unit. A supply of Airmat Filter sheets shall be included in the proportion of one carton (100 sheets) to every three filter units in the installation (approximately).

The filtering medium shall be a fibrous textured mat, made up of multiple layers of porous cellulose material, held in position between metal screens attached to a light metal frame or pocket. These pockets in turn shall fit into a skeleton frame and be held firmly in position against felt seals by spring locking devices. The skeleton frames shall be equipped with sliding bars with grips attached. The end frame in each horizontal row shall be equipped with a vibrator, which, when operated will transmit a vibratory action to all the pockets in that row. The required number of frames shall be bolted together in the form of a rigid wall. All joints and cracks between the filter units shall be calked with filter putty.

Sheet metal connections shall be made to the filter framework in such a way that the top and sides of the filter shall be entirely enclosed. All sheet metal connections between the filter and fan shall be made practically tight against air leakage. A space of at least 3 feet shall be left on the air intake side of the filter for servicing purposes. An access door shall be provided in the sheet metal duct on each side of the filter.



Airmat Pocket Type Filter Installation in one of world's largest radio plants. Air intake side showing weather louvers at right of picture.

SOME PROMINENT USERS OF AIRMAT FILTERS

DUPONT VISCOLOID CO.
DUPONT PATHE FILM CO.
CELLULOID CORPORATION
BAKELITE CORPORATION
PARAMOUNT FAMOUS PLAYERS
TECHNICOLOR MOTION PICTURES
TRIPLEX SAFETY GLASS CO.
PITTSBURGH SAFETY GLASS CO.
LIBBY-OWENS GLASS CO.
EASTMAN KODAK CO.

CORN PRODUCTS REFINING CO.
CARRIER ENGINEERING CO.
COOLING & AIR CONDITIONING CO.
WOOLWORTH STORES
B. G. SANDWICH SHOPS, INC.
FLEISCHMAN YEAST CO.
AETNA LIFE INSURANCE CO.
AMERICAN TELEGRAPH & TELEPHONE CO.
WESTERN UNION TELEGRAPH CO.

GENERAL ELECTRIC CO.
COMMONWEALTH EDISON CO.
WESTERN ELECTRIC CO.
WESTINGHOUSE ELECTRIC CO.
GRIGSBY GRUNOW CO.
KIMBERLY CLARK CORPORATION
ELGIN NATIONAL WATCH CO.
NATIONAL TUBE CO.
ILLINOIS STEEL CO.
CARNEGIE STEEL CO.

Other Automatic Air Filter Products



Multi-Panel

(Bulletin No. 240)

For either building or industrial ventilation and air cleaning. Self-cleaning feature places operation on purely mechanical basis, eliminating need of attention and assuring satisfactory performance at all times. Ideal for buildings where fully automatic air cleaning is desired and for



Horizontal

(Bulletin MH-2)

industrial plants, such as steel mills, requiring continuous, uninterrupted service under heavy dust concentrations. Manufactured in the designs shown, for either continuous or intermittent service. Available in sizes suitable to desired capacity and to space conditions.



Phoenix

(Bulletin No. 250)

Standard Unit Filters



For both general building and industrial ventilation. Constructed on the unit principle, incorporating standard sheet steel frame and interchangeable cell; furnished in either expanded metal or crimped wire type filter media as required. Easily installed in either old or new ventilating systems.

(Bulletin No. 201)

Airmat Dust Arrester

Admirably adapted for the recovery of valuable dust, for abating the dust nuisance in factories and factory districts and for saving fuel and eliminating drafts due to recirculation of air in winter. Furnished in standard dust "boxes" and in dust arrester "systems" designed for individual needs.



"Dust Box"

(Bulletin No. 230)

Special Filters for Air Compressors and Engines

Type SCF



Prevents unnecessary wear, eliminates frequent valve cleaning and reduces lubricating oil consumption by keeping dust and grit from entering cylinders. Made in all sizes ready to attach to air intake.

(Bulletin No. 120)

Type "E"

A small compact filter for portable or stationary compressors, oil or gas engines, tractors, trucks, etc. Made in 5 sizes from 25 to 450 C. F. M.



Warm Air Furnace Filter

Placed in the cold air return eliminates dust, dirt and soot. Provides clean filtered heat for the home. Keeps walls and draperies fresh and clean all winter. Makes warm air cleaner than any other heating system at a fraction of the cost.

(Bulletin No. 115)

Window Ventilator Filters



A miniature self-contained ventilating system for small offices, laboratories, finishing rooms, etc. May be placed in window or wall opening and operated from the lighting circuit.

(Bulletin No. 116)

AMERICAN AIR FILTER CO., INC.

General Offices

First and Central Avenue, Louisville, Ky.

Incorporated

Offices in Principal Cities

Factories:

Bradford, Pa. and Louisville, Ky.

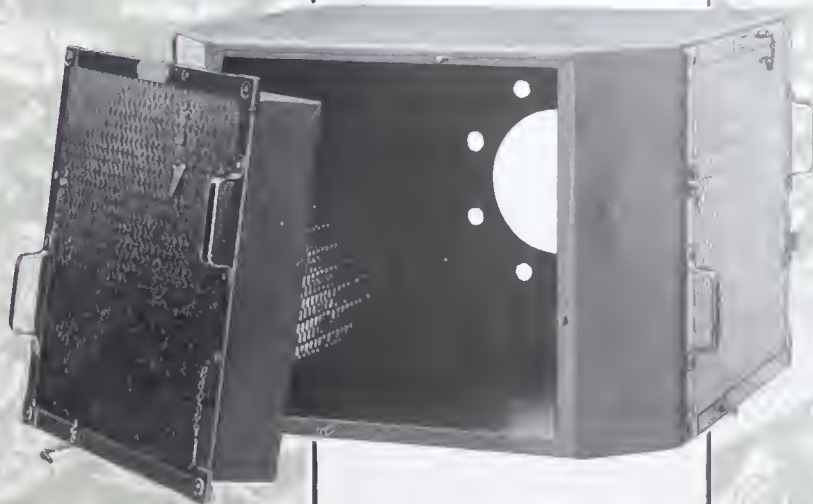
MIDWEST
TRADE MARK

Reed Air
filters

NATIONAL
AIR FILTERS
TRADE MARK

AMERICAN AIR FILTERS

for
Compressors
Diesel Engines
and
Gas Engines



AMERICAN AIR FILTER COMPANY, INC.

INCORPORATED

MIDWEST
TRADE MARK

Reed Air
filters ALL METAL

NATIONAL
AIR FILTERS
NATIONAL
TRADE MARK

GENERAL OFFICES



LOUISVILLE, KENTUCKY

The Need For Clean Air

NOT many years ago an air filter on an automobile engine was unknown, but today every fine car and most of the less expensive machines are equipped with some kind of an air cleaner. The need for clean air is clearly recognized by automobile manufacturers, and they are spending millions of dollars annually to secure it. Most automobiles are driven less than 50,000 miles before being discarded. Assuming a driving speed of thirty miles per hour, an automobile is consigned to the junk pile after the engine has operated only 1,650 hours. On the other hand a Diesel engine or air compressor, averaging less than seven hours operation per day, would run 1,650 hours in 8 months, and is expected to last ten or fifteen years at the very least.

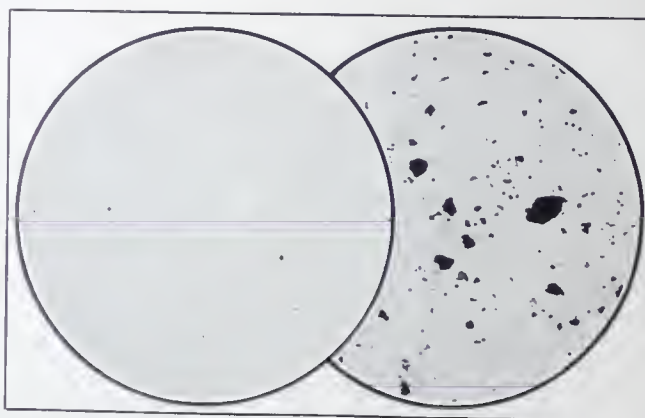
From this it would seem apparent that if clean air is a problem worthy of any consideration on the part of the automobile industry, it is of vital interest to owners and operators of air compressors and Diesel engines.

According to authorities the air in industrial districts contains from one grain to four grains of dust per 1,000 cubic feet. In order to visualize what a small amount of dust this is, picture a room 10' high by 10' wide and 10' long; there you have 1,000 cubic feet. Now divide a pound of dust into 7,000 parts and distribute one of these parts uniformly in the air of this room, and you have one grain of dust per 1,000 cubic feet. This air would appear quite clean. In fact you could easily distribute twenty grains of dust in the same amount of air and it would not be visible except in a strong beam of light.

This relatively small amount of dust may seem insignificant until you figure it out for some partic-



ular engine or compressor; for instance the displacement of a 500 H. P. Diesel is approximately 2,000 C. F. M. Operating ten hours per day this engine will draw in eight million four hundred thousand cubic feet of air in a week, which will contain from 1.2 pounds (at one grain per 1,000 cubic feet) to 4.8 pounds (at four grains per 1,000 cubic feet) of abrasive dust. The difference between ordinary air, and air cleaned by American Air Filters is graphically shown by the two micro-



Micro-photographs of dust samples showing the surprising amount of invisible dust in outside air, and after passing thru an American Filter.

photographs. Each dust sample has been enlarged sixty diameters, and the gritty nature of the dust particles is quite apparent.

These small dust particles defeat the purpose of lubrication by breaking the oil film which is intended to prevent metal to metal contact, and act in much the same manner as a grinding compound. The result is excessive and unneces-

sary wear on pistons, cylinders, and bearings, stuck pistons, and contaminated lubricating oil. Dust is also deposited on valves causing them to stick, and to require frequent cleaning. As an example the valves on a 5,000 C. F. M. Compressor at the shops of the L. & N. R. R. required cleaning every two weeks, but after American Air Filters were installed the only attention necessary was wiping off once every six months. It is also estimated that from 85% to 95% of the so called "carbon" which is deposited in internal combustion engines, is nothing more or less than dust saturated with oil and baked into a hard mass.

Practically every manufacturer of air compressors and oil engines in the United States recommends the use of American Air Filters, even where the dust conditions are not noticeably bad, and their indorsement is the most convincing evidence which can be offered for the need of clean air.

The Adhesive Impingement System of Air Filtration

PRACTICALLY all air filters operate on the Adhesive-Impingement principle. Dust-laden air is drawn through a series of viscous coated metal baffles, called the filter media, which break up the air stream into innumerable fine sub-currents, causing the dust to be impinged against the many surfaces of the baffles. It is obvious, therefore, that the effectiveness of an air filter of this type, measured in terms of cleaning efficiency resistance to air flow, dust holding capacity, and maintenance, is determined entirely by the construction of this filter media.

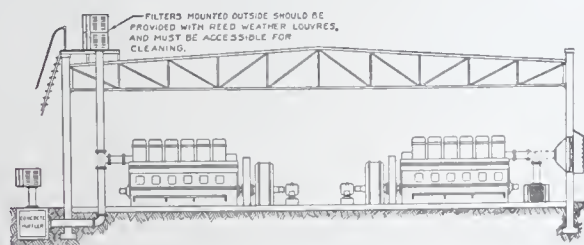
Filter Media

The filter media used in the American compressor and engine filters consists of either expanded metal or galvanized crimped wire, depending on the kind of air cleaning required and whether the unit is to be used for compressor or engine service. Ordinarily, the expanded metal media

CLEAN AIR SAVES
WEAR AND
TEAR

point is packed loosely, increasing in density towards the rear of the cell. Dust is thus uniformly distributed throughout the entire cell, a fact which explains the high cleaning efficiency, the low resistance, and the unusually large dust holding capacity of this equipment. Efficiency is 97% to 99% guaranteed, resistance 3/16" water guage when operated at rated capacity.

American Air Filters are easily installed at any point on or near the machine or at a point outside the building. In most instances it is desirable to have the engine intake outside the engine house. Several suggested installations are shown in the accompanying cut. The most important point is to locate



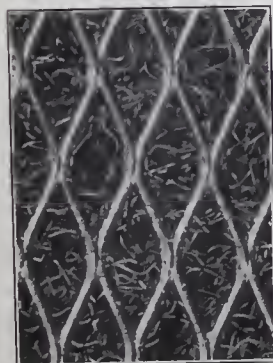
the filters where they can be easily inspected, and the cells removed for cleaning. Filters should always be installed so that cells are upright as shown in cuts. As a general practice installations on the roof should be avoided, but where it is necessary to make such an installation, special care should be taken to provide an easy method of access for inspection and servicing.

Easy Maintenance

Since there are no moving parts to wear out or require attention, there is practically no replacement or repair costs on American Air Filters, nor is operating supervision of any kind necessary. The principal item of cost is the periodic cleaning and recharging of the cells and this is practically negligible. Owing to the large dust holding capacity of these filters, cleaning is required only at infrequent intervals.

Technical Data

Each American Air Filter cell is 20 inches wide, 20 inches high and 4 inches thick. Its weight is only 20 lbs., thus making it extremely light and easy to handle. Removal of the cell for cleaning and recharging is quickly accomplished by loosening four wedge fasteners, located near the corners of the unit.



Close-up of face of clean cell, with filter media of galvanized crimped wire.



Close-up of face of clean cell—filter media of expanded metal

TYPE SCF FILTERS

for Air Compressors, Diesel Engines, Gas Engines

TYPE SCF Filters are complete assemblies which can be installed on air compressors and Diesel engines, simply by bolting to the air intake pipe. A housing is provided to receive from one to twelve standard filter cells, 20" square by 4" thick. The housings are made of 10 gauge steel, and all seams are electrically welded, insuring a rigid air-tight container. Opening is usually provided in bottom with bolt holes, to fit standard pipe flange. It is practical, however, to provide opening in top or back. By referring to drawings on page 5 you can determine the maximum size opening which can be provided in type SCF Filters to fit standard pipe flanges. In case it is necessary to use a larger pipe than that shown, a filter to meet any special conditions can be constructed at a very slight additional cost.

Type SCF Filters may be installed either inside or outside the building. On outside installations the face of the filters should be protected from the weather by constructing a shed of some kind, or by providing them with Weather Louvres as shown in Fig. 4. These weather louvres are easily removed and form an effective protection against heavy dust, rain and snow. Type SCF Filters are recommended and sold by every large compressor manufacturer in the United States,



and by most of the oil engine manufacturers. They are a tried and proven product, having been on the market for over 8 years and the large number of repeat orders received is convincing evidence of their real value. The American Air Filter is superior to any other air cleaner from the standpoint of engineering, construction and performance, and is manufactured and guaranteed by the largest air filter company in the world.



Fig. 2 No. 1 Type SCF Filter

Guarantee

Every installation of type SCF Filters made in accordance with the recommendations of the American Air Filter Company, its authorized representatives, or agents, is guaranteed to be satisfactory to the purchaser. Full purchase price will be refunded on any such equipment, returned within 60 days from date of invoice, in case it does not measure up to every claim made for it. Any purchaser who is not thoroughly satisfied can take advantage of this guarantee simply by stating the cause for returning, and requesting shipping instructions. No arguments no red tape.



Fig. 1 No. 1 Type SCF Filter Equipped with Weather Louvre



Fig. 4 Type A Louvre

TECHNICAL DATA

CAPACITY TABLES TYPE "E" AND TYPE "SCF" FILTERS

Type Filter	Capacity Constant Flow C.F.M.	Compressors		4 Cycle Engines (Gas or Diesel)				2 Cycle Engines Crankcase Scav'g		2 Cycle Engines D. A. Scav'g Pumo
		Double Acting C.F.M.	Single Acting C.F.M.	1 Cylinder H.P.	2 Cylinder H.P.	3 Cylinder H.P.	4 Cylinder H.P.	1 Cylinder H.P.	2 Cylinder H.P.	H.P.
No. 5E	68	50	25	1-4	1-8	1-12	1-16	1-4	1-8	
No. 6E	112	85	45	5-7	9-14	13-21	17-28	5-7	9-14	
No. 8E	160	120	60	8-10	15-20	22-30	29-40	8-10	15-20	
No. 10E	270	200	100	11-16	21-32	31-48	41-64	11-16	21-32	
No. 12E	360	270	135	17-22	33-44	49-66	65-88	17-22	33-44	
No. 16E	650	500	250	23-38	45-76	67-114	89-152	23-38	45-76	
No. 1 SCF	800	600	300	39-47	77-95	115-140	153-190	39-47	77-95	100-120
No. 2 SCF	1600	1200	600	48-95	96-190	141-280	191-380	48-90	96-180	121-210
No. 3 SCF	2400	1800	900	96-140	191-285	281-420	381-570	91-130	181-260	241-360
No. 4 SCF	3200	2400	1200	141-190	286-380	421-560	571-760	131-170	261-340	361-480
No. 5 SCF	4000	3000	1500	191-235	381-475	561-700	761-950	171-215	341-430	481-600
No. 6 SCF	4800	3600	1800	236-280	476-570	701-840	951-1140	216-260	431-510	601-720
No. 8 SCF	6400	4800	2400	281-380	571-760	811-1120	1141-1520	261-340	511-650	721-900
No. 9 SCF	7200	5400	2700			1121-1260	1521-1710	311-385	681-770	961-1080
No. 10 SCF	8000	6000	3000			1261-1400	1711-1900		771-860	1081-1200
No. 12 SCF	9600	7200	3600			1401-1680	1901-2280		861-1030	1201-1440

NOTE: Capacity shown for double acting compressors also applies to all other types except single cylinder single acting. Filter recommendations based on horsepower, shown for engines, are only approximate. Wherever possible secure bore, stroke, I.P.M. and number of cylinders and figure displacement per formula shown below. Then check your results against data given in above tables.

THE capacity of an American Air Filter is determined by the maximum velocity of air flow. This accounts for the fact that different capacities are shown when filters are used with single acting and double acting compressors, and with different types of oil engines. In a one cylinder 4 cycle engine, for example, the entire displacement is drawn thru the filter in just one-fourth the time consumed in drawing the same displacement thru a double acting compressor; consequently four times as much filter area is required.

To Figure Displacement

To figure displacement the following formula may be used.

$$B^2 \times .7854 \times S \times (\text{RPM}) \times N \times K$$

D =

1728

In which D = Displacement in cu. ft. per minute, B = Bore in inches, S = Stroke in inches, RPM = Revolutions per minute, N = Number of cylinders, K = variable depending upon type of engine or compressor, and having the following values:

Double Acting Compressors K = 2.

Single Acting Compressors K = 1.

Two cycle engines K = 1.

Four cycle engines K = $\frac{1}{4}$.

Maintenance

The maintenance of American Air Filters is a very simple matter. Only three to six minutes is required for cleaning and charging each cell, when the proper auxiliary equipment is provided at a convenient location. Each filter cell should be cleaned and recharged with charging liquid at regular intervals which vary from two to eight weeks, depending upon the number of hours of operation, and the amount of dust in the air. Six weeks is about the average. To clean, remove the dirty filter cell by loosening the four wedges, and replace immediately with clean spare cell. Fill cleaning tank three-fourths full of hot water and dissolve in it one pound of Reed Cleaning Compound or $1\frac{1}{2}$ pounds of ordinary washing soda. Allow dirty cells to soak in this solution for five minutes then move up and down vigorously forcing the water thru the filter media. When removing cells from cleaning tank drive the floating dirt to one side and slide the filter out edgewise by one handle. Drain for a few minutes to remove surplus water, and charge immediately by dipping filter in tank containing 10 gallons of charging liquid. Remove from charging tank and drain at least 12 hours before placing back in service.

Auxiliary Equipment

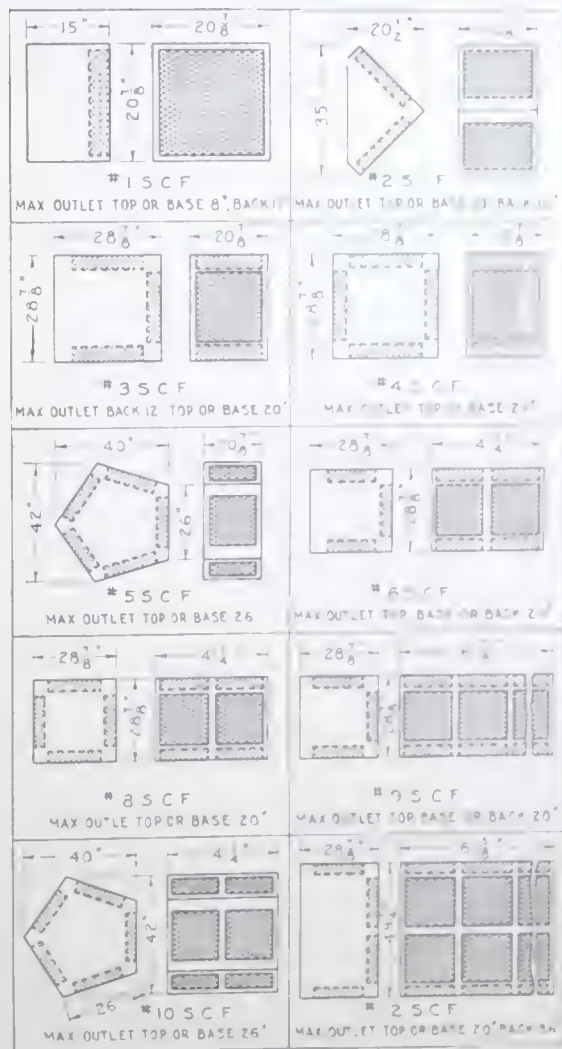
The following auxiliary equipment is recommended to insure proper maintenance:

1 spare cell for every 5 active filter cells.

1 Washing and Charging Tank.

10 gallons of Viscosine.

One type "C" tank is usually supplied for servicing 1 or 2 filter cells; One type "A" tank for servicing from 2 to 6 cells; and one type "A" and one type "C" tank for more than 6 cells.



Standard Unit Filters With Frames for Installations Requiring More Than 12 Cells

FOR handling volumes of air up to seventy-two hundred C. F. M., it will usually be found more convenient and more economical to employ Type SCF Filters, but for handling larger volumes, and in certain cases where space will not permit the installation of Type SCF Filters, standard units and frames as illustrated in Fig. 5 can be supplied. The frames are bolted together to form a permanent filter partition as shown in Fig. 6, and a housing is constructed which,

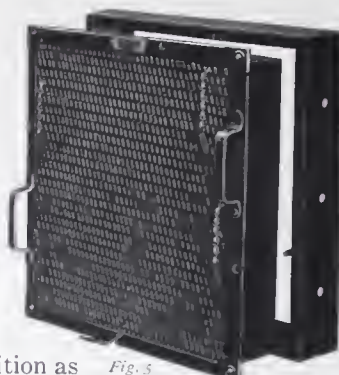


Fig. 5



Fig. 6

in turn, is connected to the air intake pipe of engine or compressor.

A very effective installation of this nature is shown in Fig. 7. A total of 12 filter units are employed, arranged in three banks of four each, and protected from the weather by louvres mounted on hinges. You will note that these filters are readily accessible for inspection and cleaning. This is a point which should be given careful consideration when planning the location of either Type SCF or unit filters.

It is not claimed that American Air Filters are effective silencers, but they reduce the noise of the air intake to a noticeable degree, and make it much less objectionable.

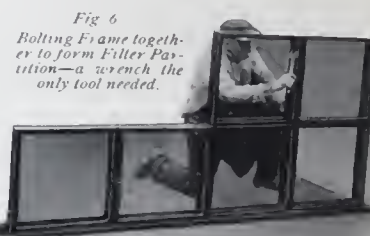


Fig. 7
Bolting Frame together to form Filter Partition—a wrench the only tool needed.

Technical Data

Size of Frame—Overall	20"x20"x4"
Effective opening of filter cell	2 1/4 Sq. Ft.
Type of Filter	(1-A (crimped wire) (1-B (expanded metal)
Resistance to air flow	3/16" Water Gauge
Weight of Filter Cell	20 Pounds
Weight of Filter Frame	10 Pounds

Steam Cleaning Tank

FOR installations consisting of twenty or more filter cells, and under conditions where the character of the dirt makes cleaning by the ordinary method difficult, a steam cleaning tank is recommended. The filter cells can be cleaned much more rapidly, and the labor required for manual washing is entirely eliminated. The steam cleaning tank will work satisfactorily on any

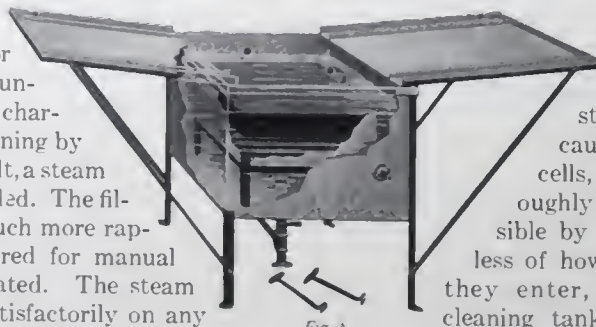


Fig. 8

steam pressure from two pounds to one hundred and fifty pounds. Live steam boils the water and causes it to surge thru the filter cells, cleaning them more thoroughly and uniformly than is possible by manual cleaning. Regardless of how dirty the cells are when they enter, they leave the steam cleaning tank as clean as when new.

Type "E" Compressor Filters



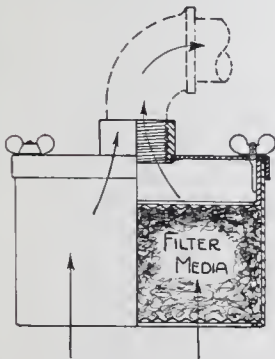
TYPE "E" Compressor Filters are designed for small compressors and engines having displacements less than the minimum rating of standard filter units. The type "E" Filter is a compact self-contained unit, provided with standard pipe thread, and is easy to install on the air intake of portable or stationary compressors, Diesel and gas engines, small blowers, etc. This type of filter is

also used on the carburetor air intake of tractors, motor trucks, motor busses, taxi cabs, and pleasure cars.

When it is at all practical to do so Type "E" Filters should be installed with the face of filter down, as shown at the left. This permits the heavier dust deposits to shake off, and prevents floating dust from settling on the face

of filter. Satisfactory operation can be secured, however, when mounted in any position.

The filter cell is easily removed by loosening wing nuts, and may be cleaned by washing either in hot water as described on page 5, or by washing in gasoline or kerosine. No special washing tank is necessary, as a bucket can be satisfactorily used on the smaller size filters, and an ordinary wash tub can be used on the No. 16 filter. Best results will be obtained by recharging filter cells with Viscosine after cleaning, but in cases of emergency light lubricating oil may be used.



Sizes and Capacities Type "E" Filter

Size	Displacement C. F. M.		Overall Dimen.		Shipping Weight	Standard Outlet
	Doub. Act.	Sing. Act.	Diam.	Length		
No. 5	0-50	0-25	5	7"	5 lbs.	1 1/2"
No. 6	50-85	25-45	6 1/2	7 1/2"	6 lbs.	2"
No. 8	85-120	45-60	8 1/4	8"	8 lbs.	3"
No. 10	120-200	60-100	10 1/2	8 1/2"	12 lbs.	4"
No. 12	200-270	100-135	12 1/4	9 1/2"	16 lbs.	4" or 6"
No. 16	270-500	135-250	16 1/2	10 1/4"	24 lbs.	6"

What You Save —

Valve cleaning costs.

Valve regrinding and valve replacement expenses.

Shut down delays.

Cylinder reboring and liner replacement costs which dust otherwise makes necessary.

25% to 50% of the lubricating oil required when dusty air is used.

Many dollars otherwise lost in the wasted power and reduced capacity resulting from dust wear on cylinders and leaky valves.

Years in the life of your compressor or engine.

Certified performance reports showing definite savings on typical American Air Filter installations are available without cost.



A Few Repeat Orders for American Engine and Compressor Filters

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Republic Iron and Steel Co.

Cotton Gins

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Chickasha Cotton Oil Co. & Subsidiaries
Indianapolis Gins
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Swift and Company
National Biscuit Co.
Red Stone Milling Co.

Miscellaneous

Capstan Glass Company
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Gardners and Shippers Ice Co.
Pelican Ice Co.
Pittsburgh Glass Co.
Royal Typewriter Co.

AMERICAN AIR FILTER CO., Incorporated, 215 Central Ave., LOUISVILLE, KY.

